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THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.

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No. XI., OF VOL. I., 1938. LONDON, SATURDAY, MARCH 12, 1938. Price 1s.
No. 5976. VOL. CCXXXIV Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

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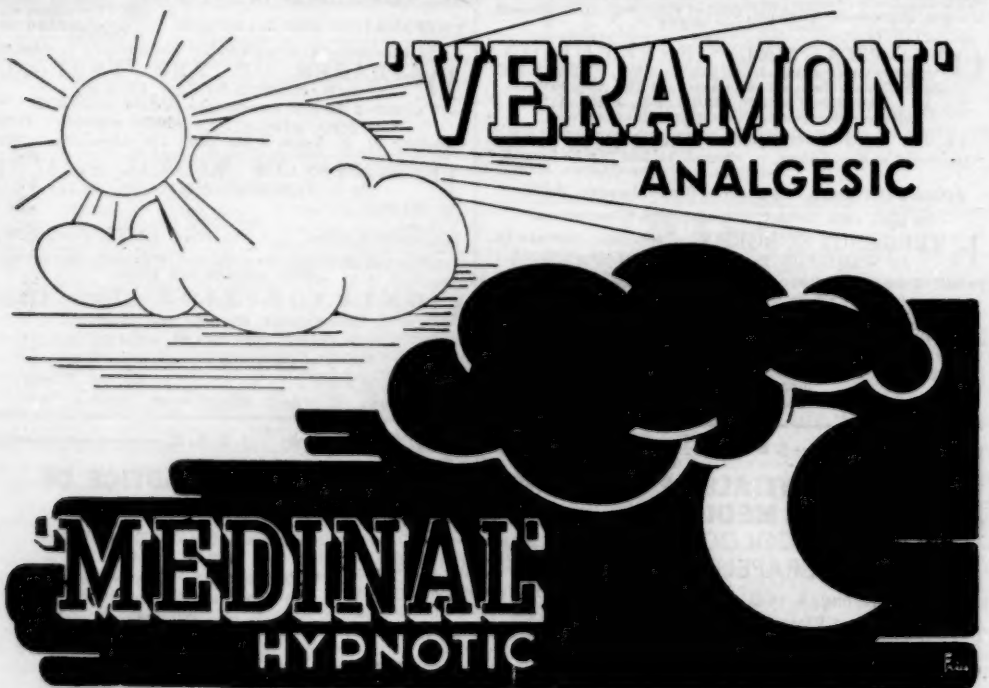

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A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 5976 LONDON: SATURDAY, MARCH 12, 1938 CCXXXIV

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ADDRESSES AND ORIGINAL ARTICLES

THE PUBLIC HEALTH ASPECT OF HEART DISEASE IN CHILDHOOD*

By Bernard Schlesinger, M.A., M.D. Camb., F.R.C.P. Lond.

PHYSICIAN TO CHILDREN'S DEPARTMENT, ROYAL NORTHERN HOSPITAL, AND PHYSICIAN TO OUT-PATIENTS, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET, LONDON

I

A review of the social aspect of heart disease in childhood is particularly apposite at a moment when the health of the nation, especially of its younger members, is so much in the public eye. My observations have been confined to acquired cardiac disease, and in childhood this virtually means rheumatic carditis, since syphilis, arterio-sclerosis, and degenerative conditions are negligible in early life.

The high incidence of juvenile rheumatism in this country—especially in its large, over-populated cities—has been so well established that it is unnecessary for me to give figures. It is striking how many writers introduce the subject with a gloomy reference to the mortality. This has tended to bias the reader's mind unfavourably and, while rightly emphasising the dangers of the disease, it has given juvenile rheumatism a blacker reputation than it deserves. To approach the social aspect in a pessimistic attitude is almost to accept defeat at once.

America was one of the first countries to take practical steps to combat the disease in childhood, although some of the more recent writers from that country question the ultimate value of the various costly measures undertaken (Cahan 1929, Stroud 1933, and others). In England an optimistic attitude prevails, with the result that arrangements for treatment and supervision of juvenile rheumatism, so warmly advocated by Poynton and inaugurated in London by Sir George Newman, are now becoming available in other parts of the kingdom. The scheme in London, provided by the county council and the Board of Education, is certainly more complete than that of any other city in the world. It has been extended in recent years and is now estimated to cost just over £220,000 annually.

In these lectures I want to review the existing system, examine its shortcomings, and discuss its possible improvement. Above all I should like to show the immense value of the work and to demonstrate how with proper care and supervision the average child with a damaged heart may develop into a tolerably healthy adult and a useful member of the community.

Whilst in charge of a country convalescent heart hospital for children at West Wickham, administered by the Invalid Children's Aid Association, I have had an opportunity of examining over a 1000 cases and following them personally for varying periods during the last ten years, many of them through adolescence into adult life. Only 57 old patients remain untraced—a proportion too small to influence the conclusions.† This hospital admits girls up to sixteen years and boys up to eight, so that the series contains many more females than males. Apart from the fact that mitral stenosis is more common in women, I am not aware of any influence of sex on the ultimate prognosis of heart disease. The deleterious effect of pregnancy in women is about matched by the harmful influence on a damaged heart of some of the more arduous forms of manual employment that are open to men. The uneven balance in regard to sex in the present series is therefore of no material consequence.

Before embarking on a detailed analysis of the prognosis of juvenile rheumatism it is important to define the standards adopted in the diagnosis of heart disease. The attempt to recognise the very earliest signs of cardiac involvement and prevent further damage leads to many children being sent to convalescent heart hospitals unjustifiably labelled as cardiac cases; there have been about 200 instances of this at West Wickham during the last ten years. A presumptive diagnosis of mitral stenosis is almost as common. Congenital malformation, again, is not always easy to distinguish from acquired disease. In about 30 cases admitted to West Wickham this error has been disclosed by careful attention to the physical signs, the absence of a rheumatic history, and the discovery of an abnormal heart early in infancy. They have been excluded from the series under consideration.

PHYSICAL SIGNS: SIGNIFICANCE OF MURMURS

Cardiology in children cannot be approached in quite the same way as in adults, for at an age when heart disease is developing, symptoms are usually less pronounced and physical signs of much greater significance. The ability to detect any degree of cardiac enlargement by simple clinical means is certainly a help. Often, however, well-marked heart disease may be present without any material enlargement at the time of examination, and the physician, therefore, has to rely more on auscultation. This raises the vexed question of *systolic murmurs* heard over the mitral area.

I am well aware that the diagnosis of *mitral regurgitation* in adults is no longer so popular as it was and that systolic murmurs have lost a good deal of their clinical significance (Mackenzie 1925, Lewis 1933). This may be true of adults, but in a rheumatic child the discovery of this murmur is a matter of some concern, particularly if it has not been heard previously. To wait for signs of mitral stenosis or evidence of cardiac enlargement before giving appropriate treatment is to delay too long. Experience has shown that the first rheumatic onslaught giving rise to a systolic murmur may only be a stage in the development of serious myocarditis or of progressive mitral stenosis. Fortunately only a proportion of the cases run this downhill course; a fair number remain stationary and quite a few recover completely. In the group of rheumatic cases about to be analysed therefore, a constant apical systolic murmur has been taken as a-priori evidence of damage in the region of the mitral orifice, probably with valvulitis, and as an indication for investigation and treatment. Cardio-respiratory, hæmic, and exocardial murmurs have naturally been excluded as far as possible. Recumbency has been the standard posture during examination, the effect of exercise has been noted, and systolic basal murmurs have always been disregarded.

There has never been any argument about *diastolic apical murmurs;* they have always been accepted

* The Milroy lectures for 1938, delivered before the Royal College of Physicians of London on Feb. 24th and March 1st. Lecture II will appear in a later issue of THE LANCET.

† The 57 cases have not been included in the 1000 cases detailed in Table I.

as evidence of organic disease and usually as an indication of early mitral stenosis. It is well established that a long rumbling diastolic apical murmur or a loud "crescendo" presystolic murmur is clear evidence of well-*developed* mitral stenosis. Whether in other cases a short or less distinct diastolic or presystolic bruit, sometimes only discovered after exercise, can always be taken as a certain sign of *early* mitral stenosis is not so clear. It is true that with a progressive lesion the diastolic murmur gradually becomes more obvious. In others the early signs never change, in which case the heart has probably quite recovered from its original inflammation except for a slight non-progressive narrowing of the mitral orifice. These are accepted facts, but it is perhaps not generally known that similar diastolic murmurs may be heard for a considerable time in a rheumatic child and may then disappear permanently.

Sheldon (1930) has devoted particular attention to this point. Among the children admitted to West Wickham and re-examined at yearly intervals since their discharge, retrogression of physical signs has been noted in about 60 different cases.

Transient diastolic murmurs apparently differ in no way from those which later become more and more pronounced with progressive mitral stenosis. I have watched them appear, persist for three years, and then vanish for as long as I have been able to follow the patient. Usually their duration is shorter than this. On several occasions I have noticed these diastolic murmurs coincide with the development of subcutaneous nodules and have seen both disappear together. It is obvious that a clinical course of this nature is confusing, and that an original diagnosis of mitral stenosis may later require modification. With the uncertainty which surrounds these early physical signs it is perhaps better to label such lesions *potential mitral stenosis*.

In the group of cases to be considered mitral stenosis has only been diagnosed when the accepted physical signs have stood the test of time. Even so a few may have been wrongly included under this heading.

The early signs of *aortic regurgitation* are sufficiently well known not to require any description, though diastolic murmurs to the left of the sternum are often missed. Transient inflammation of the aortic valve with temporary regurgitation can also arise. Poynton (1918) described this many years ago, and it occurred for a while after fresh manifestations of rheumatism in 10 of my patients. Further reference to the development of mitral and aortic disease will be made when the effect of rheumatic relapses is considered. At this juncture it is sufficient to point out the extraordinary power of recovery that exists in a child's heart once the active inflammatory process is at an end.

Aortic stenosis need hardly be considered; it is exceedingly rare in children and young adults and there were only 3 examples in the 1000 cases.

In studying the future of a large series of rheumatic children it is convenient to divide them into various diagnostic groups, such as mitral regurgitation, mitral stenosis, aortic regurgitation, and so on. At the same time it would be wrong to suppose that the prognosis is mainly influenced by the particular type of valvular lesion present, which gives no more than a rough gauge of the dose of infection through which the heart must have passed. To that extent well-marked mitral and aortic disease is a certain indication of the original degree of myocardial inflammation. The size of the heart is a more accurate measure of the damage that remains, and in adults this has the greatest bearing on the prognosis. The same applies to children, but at this early age the rheumatic "state" is of paramount importance. Smouldering activity of the rheumatic process and liability to relapse are the most important factors which prejudice the child's chance of recovery.

ANALYSIS OF 1000 CASES

All the 1000 patients were re-examined at regular intervals except about 100, and information about these was obtained from their doctors or parents. Of the whole group 817 or 81·7 per cent. are now alive and well, 60 or 6 per cent. are in poor health, and 123 or 12·3 per cent. are dead. In Table I the cases living are arranged into groups according to the number of years they have come under review, and it will be seen that quite two-thirds have been followed for 4–10 years, and only about a third for a shorter period of 2–3 years. In order to obtain an absolutely accurate picture of the prognosis each case should have been followed for the same length of time. This has unfortunately not been possible, but a fairly clear idea of the general outlook can be obtained, particularly as most of the deaths took place within four years of discharge from the Heart Hospital at West Wickham. Moreover, well over half of those who are still living have reached adolescence or adult life, and many others have passed puberty, an age at which it will be shown that new powers of resistance against the acute rheumatic process are acquired.

TABLE I—AFTER-HISTORIES OF 1000 CASES OF JUVENILE RHEUMATISM

LIVING				DEAD			
Number followed for—		Age in years at last examination.		Time interval in years after discharge from hospital until death.		Deaths in age-groups (years).	
Yrs.	Cs.			Yrs.	Cs.		
—				Under one:	17		
One:	21	0– 4:	0	One:	35	0– 4:	1
Two:	170	5– 9:	66	Two:	20	5– 9:	19
Three:	133	10–14:	357	Three:	15	10–14:	79
Four:	121	15–19:	367	Four:	13	15–19:	21
Five:	102	20 and over:	87	Five:	6	20 and over:	3
Six:	103			Six:	8		
Seven:	95			Seven:	4		
Eight:	70			Eight:	5		
Nine:	52			Nine:	0		
Ten:	10			Ten:	0		
Total	877		877		123		123

Of the 877 living 817 are well and 60 are in poor health.
Yrs. = years. Cs. = cases.

One of the most striking deductions that can be made from the figures just given is that children who survive their rheumatic attacks are later able to lead almost normal lives in a relatively good state of health, attending school with average regularity, and entering steady and useful employment when they grow up. There were, in fact, comparatively few invalids in this series. At the same time, a rheumatic child is never safe from relapses and these are the chief cause of renewed carditis, further damage to the heart, and of most of the deaths. These relapses are also reponsible for the long periods of interruption in the school career, to which these children are liable.

Another feature of heart disease in the young is the usual lack of symptoms, once the active phase is over. Precordial pain, palpitations, and dyspnœa on exertion, to mention only three symptoms which may appear later in life, hardly ever trouble the child with a chronic lesion. Persistent evidence of failure is also uncommon. Naturally it was found in those cases that proved fatal, but among all the others, chronic failure with some degree of venous congestion has only become obvious in a very small proportion (14 cases). The child with "active" rheumatism and carditis, on the other hand, certainly has a number of vague symptoms of ill health, and if not promptly treated in bed may soon show signs of cardiac failure.

In Table II the cases have been arranged according to the valvular lesions present when the last examination was made. They have been placed roughly in order of severity. Those included in the "normal" heart group have no lesion now, although at some period there may have been evidence of carditis. The difference in myocardial damage underlying these various valvular lesions has already been mentioned, and no doubt it largely accounts for the increasing severity of the prognosis as we proceed through the list.

Poynton has often referred to the curious way in which aortic regurgitation follows mitral stenosis in rheumatism, and to the favourable prognosis when on rare occasions the aortic lesion occurs by itself. These points are well demonstrated by the present series.

Developed mitral stenosis is a much more serious condition. In its late stages it can cause great disability by "throttling the systemic blood stream at its source" even though the myocardium has recovered from the original infection (Poynton 1918). The figures here show that the outlook was bad and the death-rate high in well over a third of the children with this lesion. With mitral and aortic disease combined the prognosis was even worse, although the observations of Still (1924) and others point in the opposite direction. Cotton's (1931) experience in regard to mitral stenosis in boys has been so bad that he wonders "whether it is worth while treating such cases in a special convalescent home." His deductions are based on less than a hundred cases, and the results so far obtained at West Wickham have been encouraging enough to warrant the recommendation of further admission of mitral stenosis, although cases with earlier lesions are more desirable.

TABLE II—CASES ARRANGED IN GROUPS ACCORDING TO TYPE OF HEART LESIONS PRESENT

Type of lesion.	Well.	Not well.	Dead.	Per cent. not well or dead.	Total.
Normal heart	245	13*	—	—	258
Myocarditis	4	—	—	—	4
Mitral regurgitation	344	9	15	6·5	368
Aortic disease alone—					
Aortic regurg.	11	—	1	8·3	13
Aortic stenosis	1	—	—		
Mitral stenosis	166	28	78	38·9	272
Mitral and aortic disease—					
Mitral regurg. and aortic regurg.	3	—	—	45·6	85
Mitral stenosis and aortic regurg.	43	8	29		
Mitral stenosis and aortic stenosis	—	2	—		
Totals	817	60	123	—	1000

* Some of these are ill with renewed chorea or subacute rheumatism at the time of inquiry.
Note.—Mitral stenosis: early, 39; developed, 194; undetermined, 29. Aortic regurgitation: slight, 1; free, 8; undetermined, 3. According to Grant's (1933) classification.

The profound influence of the size of the heart on prognosis is well shown in Table III. Here the benign nature of mitral regurgitation in comparison with other valvular lesions is also illustrated, and the almost identical effect of cardiac enlargement whether one or two valves are involved. Cotton (1919) states that a "breakdown is more likely to occur when the heart is enlarged" and Grant (1933) in his excellent study of adult heart disease concludes that "the after history is to be foretold not so much . . . by the type of (valve) defect but much more closely by the degree of cardiac enlargement and by the grade of cardiac failure. . . ."

TABLE III—PROGNOSIS IN RELATION TO CARDIAC ENLARGEMENT

Lesion.	Number of cases.*	
	Well.	Ill or dead.
Mitral regurgitation—		
No enlargement	240	17 (6·6%)†
Appreciable enlargement	57	2 (3·5%)
Marked enlargement	4	1 (25·0%)
Mitral stenosis—		
No enlargement	70	22 (23·9%)
Appreciable enlargement	48	40 (45·3%)
Marked enlargement	16	37 (69·8%)
Mitral stenosis and aortic regurgitation—		
No enlargement	8	3 (27·3%)
Appreciable enlargement	22	15 (45·3%)
Marked enlargement	12	18 (60·0%)

* The cases are grouped according to the size of the heart when last examined—i.e., at the end of their respective follow-up periods and in case of deaths before the relapse.
† Mostly cases that died of acute relapses with pericarditis.

The same is true in childhood, but at this age the heart certainly has greater powers of recovery and well-marked cardiac enlargement is not always necessarily permanent. On the other hand, subacute bacterial endocarditis and auricular fibrillation, the two chief factors which modify the prognosis in adults, are uncommon in children. In their place, however, is the liability to a fresh onset of rheumatism and with it the danger of further carditis.

EFFECT OF RELAPSES ON THE ULTIMATE COURSE OF THE DISEASE

Since most rheumatic children come under the care of a succession of doctors and hospitals during the course of their illness, it is usually difficult to discover at what particular stage the heart is first affected. Certain facts, however, are known. Although there is some evidence that in recurrent chorea or arthritis the heart is more liable to become affected during the first or second attacks than later (Findlay 1931), it is generally held that heart disease is more common in children who have had repeated attacks of rheumatism. Except in the very young a fatal first attack of rheumatism in childhood is exceptional and the majority of deaths from heart disease are the direct result of rheumatic relapses. A large number of children recover from relapses but are left with more cardiac damage than before.

At West Wickham and subsequently we have had a chance of observing the whole course of events in many such cases and especially of studying the development of mitral stenosis. Recurrence of

chorea or arthritis was seldom encountered under the open-air conditions of the country. The most common type of relapse has been serious fresh cardiac disease following acute tonsillitis, or pharyngitis when the tonsils had been previously removed.

TABLE IV—RELAPSES

Cause.		Effect.		Result.	
				Alive.	*Dead.*
Acute upper respiratory infection—					
Tonsillitis	37	Pericarditis	25	8	17
Pharyngitis	13	Carditis	27	17	10
Diphtheria	2	Rheumatic fever (no fresh carditis)	9	7	2
Tonsils and adenoids operation	2	"Miniature rheumatic fever"	6	5	1
Bronchitis	1				
Chorea	2	Total	67	37 (55%)	30 (45%)
Undetermined	10				

Occasionally, but not often, the operation itself reacted in the same way and provoked a relapse. Further rheumatic carditis may also follow diphtheria, probably as a result of the streptococcal tonsillitis so often associated with this infection. The various causes of the rheumatic relapses witnessed are set out with their relative frequency in Table IV. It will be seen that serious carditis or pericarditis occurred in a large proportion and resulted in a high mortality.

Fortunately some patients escape with only major or minor forms of rheumatic fever and there is no fresh cardiac involvement. Nevertheless, in the whole group the death-rate is as high as 45 per cent., and in many instances the relapses proved fatal within a few weeks. Others made a temporary recovery but ultimately succumbed to fresh rheumatic recurrences after a short lease of life. The remaining 55 per cent. are alive and well in nearly all cases, though in a good many the relapse has resulted in further extension of heart disease, such as the development of mitral stenosis or aortic regurgitation. The serious effect of a rheumatic relapse can persist for a long time, but eventually the patient makes a good recovery, and in this series no death was recorded after a period of five years (Table V). The effect of rheumatic relapses is also greatly influenced by the age of the patient. The mortality is high up to the age of 14 years; it then falls so abruptly

TABLE V—NUMBER OF YEARS SINCE RELAPSE

Time.	After-history.		Time.	After-history.	
	Alive.	Dead.		Alive.	Dead.
Under 6 mths.	0	13	6 years.	5	0
1 year.	1	4	7 „	6	0
2 years.	3	5	8 „	5	0
3 „	6	3	9 „	3	0
4 „	3	3	10 „	2	0
5 „	3	2	Totals	37	30

that the onset of puberty seems to be the only likely explanation (Table VI). This is further proof of my previous contention that the future of a rheumatic child depends largely on his ability to weather the storm during his early years and to reach the calmer waters of adolescence, when rheumatic relapses are less frequent and the power of resistance increases. Other considerations such as the child's age at the onset of the disease, the time of the cardiac relapse, and the type of valvular lesion present have on the whole little influence on the immediate prognosis.

At present there is no certain way of avoiding relapses, but if there were only some means of minimising their virulence so that the patient's resistance was not completely overwhelmed at the time, there would be more chance of steering the child safely past puberty.

ASPIRIN THERAPY

With this in view seven years ago routine aspirin therapy was instituted at the Children's Heart Hospital, West Wickham, in every case of throat infection. The details of this treatment will be given in the next lecture; here it is enough to say that its result has been so favourable as to recommend its universal adoption by doctors in charge of rheumatic children. The records show that rheumatic recurrences were less frequent in those who had received adequate aspirin therapy from the onset of their throat infection, and in the event of a relapse, that recovery was the rule (21 recoveries; 6 deaths). On the other hand, when this treatment was omitted, recurrences were frequent and severe, and the death-rate was high (11 deaths; 13 recoveries). The method, however, is not infallible and its neglect does not always entail

TABLE VI—AGE OF DEATH OR AT LAST EXAMINATION ALIVE

Years.	After-history. Alive.	Dead.
0– 4	—	—
5– 9	1	5
10–14	16	25
15–19	13	0
20 and over	7	0
Totals	37	30

serious consequences. At the same time the figures given in Table VII take no account of the numerous relapses which might have followed tonsillitis had this particular treatment not been administered. The distinct diminution of virulent relapses at West Wickham since aspirin therapy was begun also testifies to its general efficacy.

EXTENSION OF CARDIAC DISEASE

The progressive nature of juvenile heart disease is well known, but the exact way in which the extension takes place is not quite clear. There are some who believe that mitral stenosis, for example, is a very gradual process due to the slow cicatrisation of the damaged valve and its surrounding areas. This manner of onset might explain the occasional case of mitral stenosis which develops after a single rheumatic attack, with a gradually increasing presystolic murmur as the only evidence of cardiac involvement. During that time all the usual signs of rheumatic activity may be wanting. More often extension of the disease can be definitely traced to a recent relapse or to several relapses, any of which may further damage the heart. In this manner the heart may pass through the stages of a mitral regurgitation, mitral stenosis, and combined mitral and aortic disease in a series of steps.

In institutions such as the one at West Wickham, where convalescent children remain under observation for many months at a time, there is an ideal opportunity for studying the process, and certain facts that have been learnt about the extension of

valvular lesions have been tabulated in Table VIII. From this it will be seen that the development of mitral stenosis in children who already had mitral regurgitation definitely resulted from a rheumatic relapse in 80 per cent. of the cases. The time-

TABLE VII—EFFECT OF ASPIRIN THERAPY ON THE SEVERITY OF RHEUMATIC RELAPSES FOLLOWING TONSILLITIS

—	With aspirin.	Without aspirin.
Number alive	21	13
„ dead	6	11
Mortality following relapse..	22 per cent.	45 per cent.

interval between the relapse and fresh signs of heart disease varied between two weeks and six months, which shows that after any relapse a case should be carefully watched and treated for a considerable time.

The development of an aortic lesion, usually in the presence of old mitral disease, seems also to be definitely related to a preceding relapse. This connexion was found in 58 per cent.—not quite so often as in the case of mitral stenosis. It may take seven months before aortic regurgitation becomes apparent after a relapse; by that time the active inflammatory state may be over and the fresh physical signs probably point to renewed cardiac power and a healing valvular lesion.

The appearance of subcutaneous nodules in some cases just at the time when the disease is spreading throws some light on the probable cardiac pathology, but there will always be a certain number of children who develop their cardiac lesions insidiously and without other evidence of rheumatism to serve as a warning.

Before leaving the whole question it is interesting to compare the frequency with which relapses of chorea and rheumatic fever are followed by fresh cardiac involvement. Duckett Jones and Bland (1935) regard chorea by itself as a relatively benign complaint and state that the special liability to heart

TABLE VIII—EXTENSION OF VALVULITIS IN RELATION TO RHEUMATIC RELAPSES (47 CASES *)

Type of relapse.	Extension of heart disease.		
	From mitral regurg. to mitral stenosis.	From mitral stenosis to mitral stenosis and aortic regurg.	From a normal heart to mitral and aortic disease.
Rheumatic fever† ..	13	4	2
Chorea	7	2	—
Subacute rheumatism ..	2	—	—
Carditis (following tonsillitis)	3	1	—
Insidious (no apparent relapse)	6	5	2
Total	31	12	4

* Followed for an average period of five years: 33 well, 4 ill, 10 dead.
† Preceded by tonsillitis in many cases.

disease only arises when some other form of rheumatism has also been present. Without going quite to this length Findlay (1931) also believes that arthritis is a greater potential danger to the heart than is chorea. My experience has been the same (see Table IX).

PERICARDITIS

Pericarditis, being almost always associated with widespread damage to the heart muscle, is undoubtedly one of the severest forms of cardiac rheumatism and has a high mortality. It is comparatively rare during a first attack of acute rheumatism. As a rule it makes its appearance during a relapse following an upper respiratory infection in a child with established heart disease, and it is then particularly dangerous.

I have been able to follow 62 old cases for an average period of six years. Of these 62 patients 31 are dead (a mortality of 50 per cent.), 24 (39 per cent.) are alive and well, and 7 (11 per cent.) are more or less cardiac cripples. Two-thirds of the deaths were the direct result of the acute attack, often within a few weeks of its onset; in the remaining third, death was delayed for a number of years, but the children were in poor health and suffered from smouldering rheumatism or repeated relapses. Subcutaneous nodules were often associated (in 30 per cent.) and their presence was an unfavourable sign.

TABLE IX—EXTENSION OF HEART DISEASE IN RELATION TO RELAPSE OF VARIOUS FORMS OF RHEUMATISM

Type of relapse.	Relapses.	Heart disease.		Total.	Incidence of fresh carditis.
		Transient carditis.	Permanent extension.		
					Per cent.
Chorea	77	6	8	14	18·0
Subacute rheumatism	66	5	10	15	24·2
Rheumatic fever ..	77	8	14	22	28·6
Chorea and rheumatic fever ..	7	—	3	3	42·8

It was also found that patients who had once had pericarditis were liable to a second attack. When this occurred the prognosis was bad.

Children who survive pericarditis are usually left with severe myocardial and valvular damage, and the heart's action may also be seriously impaired by an adherent pericardium. Yet occasionally recovery may be so complete that years later it is difficult to imagine that there had ever been any serious heart disease present. I have notes of 7 such cases.

Whatever the outcome, the acute attack is nearly always a desperate affair; but I have seen amazing recoveries in children who appeared to be on the point of death.

Findlay's assessment of rheumatic pericarditis in Glasgow (1931) does not differ considerably from mine, although he places the mortality higher (63·4 per cent.), and even among those who did recover, his proportion of cardiac cripples was greater than we in London have been led to expect.

NODULES

Subcutaneous nodules have always rightly been regarded as a sign of serious rheumatism and as an external indication of similar inflammatory processes in the viscera, particularly the heart. The mortality is undoubtedly high and Poynton and Paine (1913) found that 54 per cent. of their fatal cases had had nodules some time during the course of their disease. It is therefore of special interest and practical importance in regard to the selection of the most suitable cases for convalescent treatment to ascertain the after-history of those children who recover.

I have been able to follow 90 cases, most of which had been seen during the active stage of their nodules.

Of these, 36 (40 per cent.) are dead, 45 (51 per cent.) are in good health at the time of this inquiry, and 7 (8 per cent.) are alive but ill. It is interesting to find that this mortality-rate of 40 per cent. among children mostly domiciled in and around London is almost identical with that worked out by Findlay among Glasgow children (42 per cent.).

My inquiries cover a decade and many of the children have been followed for 5–10 years. As quite three-quarters of the deaths took place within three years, it is fairly safe to assume that the figures given are a reasonably accurate estimate of the prognosis.

Nodules can appear at any age in childhood, although they are rare before seven years and uncommon after puberty. Another important point is that up to the age of fourteen, children who have had nodules stand only an even chance of survival (33 deaths; 22 recoveries), but thereafter puberty seems to have a remarkable effect on the prognosis. In this series, once they had passed that age recovery was the rule and death uncommon (2 deaths; 22 recoveries). We are thus constantly reminded of the increased power of resistance which comes with puberty.

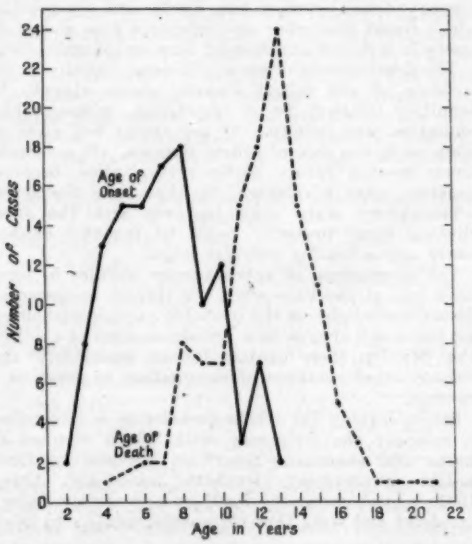
Cheadle's famous dictum that "the appearance of massive nodules was the equivalent of a sentence of death" has perhaps given his successors an unnecessarily grave outlook on this particular rheumatic manifestation. It is true that the number of nodules is to a certain extent a measure of the "dose" of rheumatic infection, and a rough count which I have carried out weekly in a series of cases gives some support to this view. In 54 cases in which this was done there were many more recoveries (31 recoveries; 7 deaths) when the number of nodules did not exceed a total of ten in various regions of the body, than when the number counted was well over that number (5 recoveries; 12 deaths). This is by no means a constant rule and one boy who reached the record of over a hundred nodules in 1929 is now quite a strong young man at work. In general, however, the prognosis is bad in patients with nodule counts between twenty and forty, and many of those who recover are found never to have had more than one to four obvious nodules during their most active stage. In a few subjects the nodule formation was no more than a definite thickening of the olecranon bursa which subsided after some months.

It is often said that nodules appear in a series of fresh crops; it must not be assumed from this that the individual nodule has only a short life-history. Careful examination will show quite clearly that each nodule may persist for months, though fresh ones may appear in the same area. On the other hand the whole process may only last a few weeks. The length of time that nodules are present seems to have no relation to the prognosis. The two longest periods over which I have observed persistent nodules were three and five years; the first child recovered, the second died.

The almost invariable association of nodules with carditis is common knowledge. Heart disease is often severe and I have notes of 4 instances of auricular fibrillation. It is improbable that a rheumatic infection severe and extensive enough to produce subcutaneous nodules will ever leave the internal organs, and particularly the heart, free from similar inflammatory lesions. In other words it is almost impossible for nodules to exist without heart disease. In certain instances the myocardium is the chief seat of inflammation and the valves escape; both the subcutaneous and cardiac lesions may then heal completely in favourable cases. I have been able to follow 5 cases where something of this kind must have happened, and now, a good number of years later, all evidence of cardiac disease has entirely disappeared. Still (1924) has quoted two similar examples.

The frequency with which acute rheumatism recurs in the original form during a relapse has been stressed and this is also true of subcutaneous nodules. In 11 children (12·5 per cent.) nodules appeared with a fresh outburst of rheumatism on more than one occasion. In all probability this figure is a conservative estimate. The mortality was found to be high in this type of case.

It would be fair to conclude from this analysis that the presence of nodules should be regarded with some anxiety but need never be taken as a fatal omen. Provided treatment is prolonged until all signs of rheumatic activity have subsided, there is an even chance that the child's future will be favourable.



Graph illustrating age of onset of rheumatism and age of death in 123 cases.

A RASH

Erythema marginatum, sometimes alluded to as multiforme or circinate, is a curious skin eruption which is occasionally seen in juvenile rheumatism. The eruption is not a very common manifestation, and I can only find notes of 13 cases among the 1000 which are now under review. Nevertheless it has a definite influence on the prognosis.

With two exceptions nodules were observed in each instance, and there appeared to be a certain loose relationship between the state of the nodules and the extent of the rash. On the other hand the rash often outlasted the nodules by many months and still remained after all other evidence of active rheumatism had disappeared. The rash has a habit of waxing and waning over long periods, and in three children, all of whom ultimately recovered, it recurred periodically apart from any other evidence of rheumatism for 3, 5, and 9 years respectively.

Of particular interest is the fact that despite the severe and extensive form of rheumatism and cardiac

disease with which the rash is generally associated, the ultimate prognosis is surprisingly good. In the 10 cases which I was able to follow for a good number of years only 2 patients died and 8 are well at the present time. Moreover, in 4 the cardiac lesions have definitely diminished in severity. Bruce Perry (1937) has come to the same conclusions and states that in 4 of his 13 cases all abnormal cardiac physical signs ultimately disappeared. It seems, therefore, that the advent of a circinate rash in a case of rheumatism with nodules is, if anything, a welcome sign.

DEATHS

Taking into consideration only cases of definite and persistent heart disease, the mortality in this series was 16·4 per cent., a figure which would have no doubt been higher had there been opportunity of following every case for ten years.

The death-rate increased gradually up to the age of thirteen years and then fell rapidly (see Figure). The age of onset of rheumatism in this group also showed a corresponding curve some five years earlier with the highest point at the age of eight.

Acute carditis was the cause of death in about two-thirds of the cases; less commonly the disease took a more chronic course and the children eventually died after prolonged cardiac failure. Subacute bacterial endocarditis was the terminal event in a few cases and auricular fibrillation the fatal turning-point in several others.

Sudden death occurred in some instances, the history in each case strongly suggesting a cerebral or pulmonary embolus.

It is repeatedly stated that rheumatism in very young children has a serious prognosis. In so far as there is greater opportunity for rheumatic relapses and hence for progressive cardiac damage before the haven of puberty is reached this is no doubt true. Interference with the growing valves and muscle of the heart would seem to be another factor; but it is amazing to what extent a rheumatic inflammatory process can completely resolve. In the present series early onset of the disease did not seem to entail a specially bad prognosis.

CONCLUSIONS

The main points with regard to the prognosis can now be summarised. Rheumatic heart disease in childhood is likely to be serious, but on the whole the outlook is not unfavourable. Many cases with every prospect of being left with severe cardiac lesions make remarkable recoveries if treated in the right way. Puberty appears to have a great effect on the patient's power of resistance and the course of the disease is therefore generally much less acute in adolescence. Rheumatic relapses are the greatest dangers; they commonly follow acute throat infections and are apt to repeat themselves in the same form in each particular case. Aspirin has been found a valuable prophylactic agent. Mitral stenosis alone or with aortic regurgitation is a formidable lesion, particularly in the presence of much cardiac enlargement. Acute carditis with pericarditis has the highest mortality of all; nodules are the chief sign of a widespread rheumatic inflammation, but with patience and proper care even this type of rheumatism will subside and many children will ultimately make a good recovery.

My second lecture will largely be devoted to a consideration of how this can best be achieved.

(*References at foot of next column*)

CLINICAL OBSERVATIONS ON THE EFFECT OF THE PARENTERAL ADMINISTRATION OF VITAMINS A AND D

BY W. NORMAN LEAK, M.A., M.D. Camb.

THIS paper records my experiences with the administration of a concentrated oily preparation of vitamins A and D by intramuscular injection. I first began to use these injections in a very tentative way in 1930 because I was impressed by the fact that many patients, who might be expected to benefit by the action then credited to those vitamins, were prevented from receiving them owing to vomiting, operation, or other causes. The preliminary results seemed so promising that I have pursued the matter further in an ever-widening investigation, and it seems opportune to restate and amplify the conclusions I first published in 1933.

It must be emphasised that the whole of this work has been undertaken in the course of a general country practice. Cases have therefore had to be taken as they arose, and it is impossible to give long lists of cases with controls. As, however, some 1500 injections have been given and the effects carefully watched, it is hoped that the results may be of some scientific value even though some are technically mere "impressions." As a result of this enforced method of working many interesting points have undoubtedly been missed; but the general effect has been so uniformly striking that it has needed no great clinical acumen to appreciate it, and as a rule the type of case has been so well known that consultant status was not required to diagnose or evaluate it. It is known, for example, that a well-established case of iritis does not rapidly cease to cause pain, and show improvement, without some definite cause; that rapidly rising temperatures do not usually reach their peak soon after midday; that the erythematous rash of herpes zoster seldom fails to progress to vesicle formation; or that patients with general peritonitis do not generally look very well. Yet all these things have been observed, not once only but regularly, in this investigation, and it is with such gross clinical observations that my paper mainly deals.

The preparation used has been one specially prepared for me by Glaxo Laboratories Ltd., and contains as its active ingredients 60,000 international units of vitamin A and 10,000 international units of vitamin D per cubic centimetre. For convenience I shall refer to this preparation as Dekadexolin, being equivalent in strength to ten Adexolin capsules. In this investigation I have used doses varying from one to

(*Continued from previous column*)

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five cubic centimetres in 24 hours, and it is worth stressing that this dosage (up to 300,000 international units of vitamin A in 24 hours) is much higher than any usually employed. It has not been used from any innate love of high doses, but because preliminary investigation with much smaller doses showed that there were distinct advantages in the large doses of dekadexolin. Though I have had a few cases of long-continued high dosage (2,000,000 units of vitamin A or so) which are not recorded here, in the main the work has involved only a few doses of dekadexolin during a few days. Although actually my results agree very well with the well-known experimental work on vitamins A and D, to which I am most indebted, it should be realised that prolonged deprivation is no absolute guide to the effects of excessive supply; for example, the symptoms of Graves's disease would hardly be inferred from the study of myxœdema, and a temporary excessive dose may not give the same results as a long-continued one (cf. acute and chronic alcoholism).

Experimental work with animals seems to suggest that vitamin A has something to do with the power of resistance of the host to infection, and dekadexolin has been used in a large variety of cases of local and general infection. These include tonsillitis, carbuncles, iritis, influenza, erysipelas, pneumonia, measles, and clinical septicæmia (distance from a laboratory makes satisfactory blood cultures difficult to obtain). I appreciate that they are all conditions in which it is difficult to get strict controls; but a comparison of six years' ever-increasing use of dekadexolin with the previous sixteen years of more normal treatment leaves no doubt in my own mind of its beneficial effects, and this opinion is shared by those patients who have had sufficient past experience to make them judges of the subjective results. I may as well say at once that I am convinced that the effect of dekadexolin is different from that of Omnadin—and probably also of S.U.P. and protein shock in general, though I have not had very much experience of these. I have seen several cases in which dekadexolin failed to give me the result I wanted, but this has followed when omnadin was employed; and I have had many in which omnadin seemed to fail but dekadexolin to succeed; and frequently I have used the two treatments together.

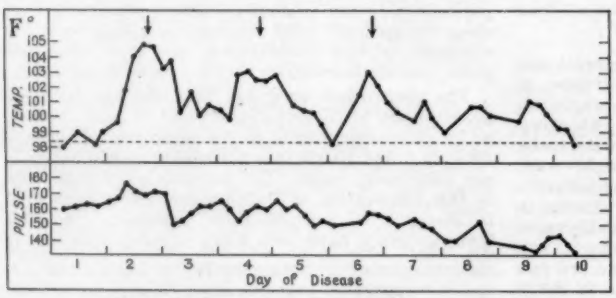

FIG. 2.—Extensive scalds in a child 14 months old.

SOME ILLUSTRATIVE CASES

The chart shown in Fig. 1 is from a case of a kind with which most practitioners are unfortunately familiar.

A boy, aged 8, had a subacute appendix removed on April 1st, 1937. Two days later his temperature began to rise rapidly, he had acute pain on the right side with typical signs of consolidation and pleurisy. The breathing, cough, and later on the rusty sputum were typical of pneumonia, a diagnosis which was, incidentally, confirmed (not that it was really needed) by the local tuberculosis medical officer who happened to be seeing another case for me at the time. Later on a large effusion appeared, which took about two weeks to be absorbed. Antiphlogistine poultices were applied locally, and dekadexolin was given twice at the times marked on the chart. A mild expectorant mixture was also given, but beyond that no other treatment. As usual in these cases the temperature, respiration and pulse-rates became normal some while before the physical signs cleared up, but after the first day the child showed little distress or trouble of any kind.

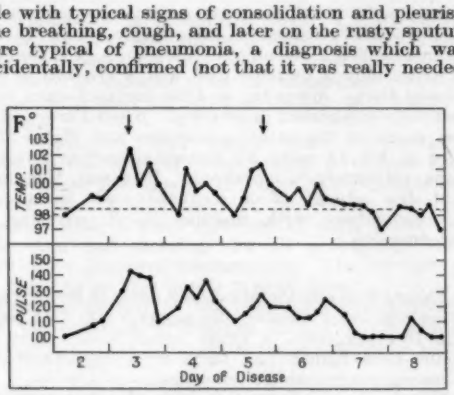

FIG. 1.—Pneumonia after appendicectomy. In this and the following charts each arrow indicates an injection of 1·0 c.cm. of dekadexolin.

Two points strike one prima facie from the chart—first, the apparent rapidity of action of the dekadexolin, and secondly, that its effect seemed to persist for some 36–48 hours. The first point is nearly always observed in febrile cases, and I have noted a slight drop in an otherwise rapidly rising temperature as little as half an hour after a dose of dekadexolin. The period of 36 hours is also usually observed in all but the acutest infections. It is probably the time taken for the product to be absorbed, and the way to get more intense effect is not to give a larger dose but to give several separate doses in order to increase the relative area from which it can be absorbed. Single doses of 2 c.cm. give little more immediate effect than 1 c.cm. and are always painful. Care must, of course, be taken not to inject the oily solution into a vein. It is easier to inject if previously warmed.

A case which shows the same features, this time one of my early ones, is shown in Fig. 2.

On Nov. 3rd, 1931, a boy of 14 months was severely scalded, about a third of the body being involved, chest, neck, chin, and tongue, both arms and both thighs; scalds ranging from the first to the third degree. The local treatment was tannic acid to a few areas, a boric and eucalyptus ointment to most. As the chart shows, with a pulse-rate running up to 170, the child was profoundly ill. On the second day the temperature rose rapidly to 104·8° F. with pulse and respirations to match, and I suspected broncho-pneumonia at the left base. Dekadexolin was given and within six hours the temperature had dropped 2° and the next day the child seemed less ill. The second injection was followed by a slower but more complete drop in temperature, though not of pulse or

respiration, and the child seemed remarkably well. A third injection was given for a third rise of temperature and in spite of some irregular fever the child made a complete and uninterrupted recovery.

Once again the 36-hour period is clearly marked, and it may be noted that the dose was the same for the infant as for the larger child. As a matter of fact, apart from any local pain or swelling, dekadexolin seems remarkably innocuous (it must be remembered that we are here dealing presumedly with a strictly temporary intense hypervitaminosis and not with a long-continued one). This was shown by an unwanted illegitimate baby of six months who came under my care when practically moribund after about a month's broncho-pneumonia. The chart (Fig. 3) speaks for itself. The first injection seemed to give the child sufficient power to show some reaction to its infection. The four subsequent ones seemed to terminate the illness, apart from the rise on the fifth day. Whether because of, or in spite of, the heroic doses, the baby made a complete recovery and showed no ill effects from receiving 300,000 units of vitamin A and 50,000 of vitamin D in 48 hours.

I myself, in 1933, when suffering from septicæmia (contracted from a patient who died of it) received 25 c.cm. (1,500,000 units vitamin A) in six days. This was deliberate over-dosage to test for any ill effects, but I was not able to detect any.

Such cases as these could be multiplied many times, though seldom with four-hourly temperature charts; for in a country practice such things are almost unobtainable outside the local hospital. The result I have found is almost always the same, and when it does not follow there is usually some unsuspected cause at work. For instance, I was surprised not to see the expected improvement within twelve hours in a bad case of tonsillitis, but another twelve hours showed the typical rash of scarlet fever. As the patient was at once taken to the isolation hospital, I was prevented from seeing what effect more dekadexolin would have in such a case.

A very interesting case was that of a woman of 78 with pernicious anæmia who had many falls as a result

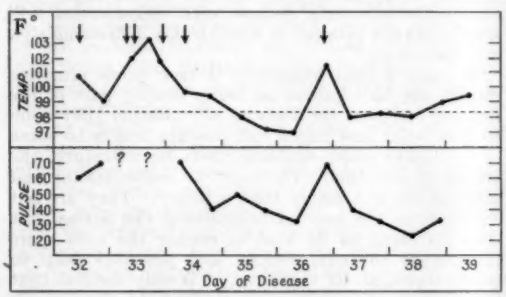

FIG. 3.—Broncho-pneumonia in an infant 6 months old.

of combined degeneration of the cord. When first seen there was considerable cellulitis of the arm with underlying periostitis. As no improvement took place on ordinary treatment within 48 hours—in fact she got decidedly worse—I commenced to give dekadexolin; improvement was immediate, and after four injections the arm got quite well. She was in bed altogether three weeks as a result of her accident, and to my surprise when she got up she was much steadier on her feet than she had been when her accident took place, whereas rest and infection almost always cause deterioration in such cases. I thereupon discussed the case with Prof. A. Ramsbottom of Manchester, who had seen the patient before and confirmed these particulars, and it seemed most probable that the improvement noted was due to the action of the large doses of vitamin A on the demyelinised nerve-fibres. I therefore, on Jan. 14th,

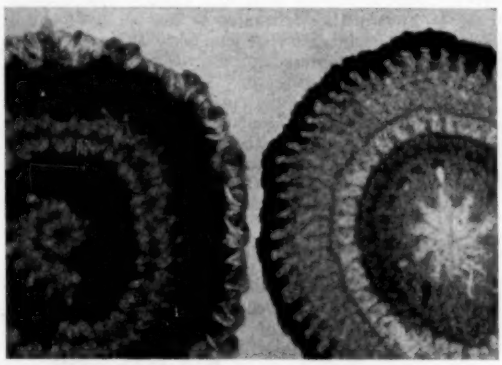

FIG. 4.—The left-hand mat was made on Jan. 14th and the right-hand one on Jan. 27th. The difference in workmanship is a measure of the patient's improvement.

1933, began to give her some more injections of dekadexolin. There was no doubt that her mental alertness improved greatly, but still more evident was the effect on the control of her hands, which had begun to suffer as a result of the degeneration of the cord, so that she could barely do the coarsest knitting. In a fortnight, after five injections, she was sewing as well as she had done for a long while before, and Fig. 4 gives some idea of the change which took place in the fineness of her stitching, though it cannot show the equally striking improvement in colour and design which is obvious in the originals.

This case started me trying the effect of dekadexolin on various nervous diseases, but in general practice these are few and far between. One case which I, my partner, and the local medical officer of health (Dr. L. J. Picton) agreed in diagnosing as early encephalitis lethargica undoubtedly improved very much after receiving 8 c.cm. in two weeks and has remained well in the intervening four years. His symptoms were fever, vomiting, distinct hebetude, ptosis, some facial palsy, increased knee-jerks, normal plantar and eye reflexes. I have tried the remedy in well-established cases of parkinsonism without any result. Two nerve cases however showed dramatic results.

One patient was a girl of 21 who suddenly became blind in her left eye in February, 1933, and after prolonged investigation in Manchester Royal Infirmary was finally diagnosed as early disseminated sclerosis. She made slow irregular progress and in April, 1933, her vision was still very poor (6/60). Doing my utmost to prevent any psychological effects, I gave the girl a dose of dekadexolin. Two days later she read 6/12, and after one more injection her vision was nearly 6/6. At that time her two fundi were apparently quite normal. Eighteen months later I had occasion to send her to see an ophthalmic surgeon and to my surprise his report was that though the left disc showed the typical whiteness, &c., of complete optic atrophy there was no diminution of the field of vision and that, with a suitable correction, the acuity was well up to normal. Thus it appears that the lurking suspicion I had that this might be mainly a case of neurosis was unjustified.

A rather similar and earlier case was a man who had been diagnosed at the Manchester Royal Infirmary as having optic atrophy of unknown origin with a hopeless prognosis, and when I first saw him his vision was below 6/60. Here recovery was rather

slower. His first injection was on March 17th, 1933, and on the 27th, after four injections, he pointed out to me three dogs playing in a field about 300 yards away. His vision was 6/9 beyond which it did not improve materially.

It is known that vitamin A has some effect on preserving the integrity of the body surfaces, and a disease which borders on the dermatological and neurological is herpes zoster. During the past three years I have treated nine cases of this malady with dekadexolin with consistent results. If the case has been a very early one with few vesicles formed, and an erythema where vesicles seemed to be appearing, within 24 hours of an injection of dekadexolin the formation of vesicles has quite ceased, and those that have formed have rapidly subsided. Post-herpetic pain also has not occurred in these cases. If the vesicles are all fully developed when the case is seen dekadexolin seems to have little effect, but my experience of such cases is too limited to say definitely. The effect of dekadexolin in this condition—a virus disease which affects a nerve-cell—makes me think that it is a form of treatment well worth trying in acute poliomyelitis. It can do no harm, and it might do a great deal of good; but I have had no opportunity of trying it so far. A large initial dose would seem desirable.

Another condition in which I have observed the effect of dekadexolin is the healing of chronic ulcers. My earliest investigations of the effect of dekadexolin were made on moribund and often unconscious patients who had broken-down wounds or bed-sores. In these in the last few days of life, when the patients were actually dying, there several times seemed to be definite local improvement. However I was led to try the effect on chronic ulcers by having two patients who developed erysipelas while being treated with adhesive elastic bandages. The erysipelas was treated with dekadexolin, and to my astonishment in each case the original ulcer healed with remarkable rapidity, in one case the first time for 18 years. I have tried it in several cases since. I have only once seen it seem to cause healing without any other therapy to the ulcer at all, but when other treatment seems disappointing I have several times seen rapid healing take place as soon as injections of dekadexolin were started, and also seen deterioration set in when the injections were stopped. Specially marked has been the way that, apparently under its influence, new, healthy, and adherent skin will spread over high granulations which ordinarily would have to be treated in some way before healing could take place. This suggests a possible application in difficult cases of skin-grafting.

There is one more observation which is incapable of demonstration by charts or case records, yet which, to me, seems as though it may afford the key to what must seem a very miscellaneous series of cases. I refer to the general appearance of cases treated by dekadexolin. Almost without exception they look very well—in fact extraordinarily well considering their illness. This is most conspicuous in cases of peritonitis, after perforated appendix for example. Two or three days after operation they may look the picture of health and really feel well even though they are actually extremely, perhaps fatally, ill. If this point is not realised treatment of acute surgical or medical cases by dekadexolin may easily prove disastrous by lulling both patient and doctor into a false sense of security. I well remember a case of paralytic ileus following a perforated gastric ulcer which showed practically none of the usual signs of dehydration and shock one expects in such a condition. I saw him three hours before he died, seven days after his operation; his tongue was moist, his eye bright, and his skin elastic, and the experienced nurse attending him could not credit it when I said that in a few hours he would be dead.

WHY SHOULD THE REMEDY BE USEFUL?

This leads me to a brief outline of what I have come to believe about this matter. It is barely even an hypothesis, and in stating it, however, I do not wish to suggest that there is only one defence mechanism of the body, nor do I wish to ignore or be presumed ignorant of the many other natural or artificial means of combating infection.

I believe then that dekadexolin supplies vitamins A and D to the body, and that its action is mainly or entirely due to those vitamins. My reason is that its action is visible even when a patient is almost moribund, in whom the natural defences are probably exhausted and incapable of being stimulated any further. Furthermore its action is rapid and not accompanied by any of the usual signs of reaction, nor does it suggest clinically the action of protein shock. Its action is also to a large extent dependent on the dose, and within limits the larger the dose given the greater the effect. All these things suggest a direct rather than an indirect action; in fact, clinical results suggest that many disease states, and also the inhalation of fat-solvent anæsthetics, are associated with a disturbance of the mechanism whereby the stores of fat-soluble vitamins are made available in the body, and that this failure can be made good by their parenteral administration in an oily solution.

Next, the appearance of well-being that the injections produce suggests that these vitamins supply to the cells of the body something which they require for complete health. As a hazardous guess one might suggest that they have to do with conserving the tissue fluids, for in many conditions in which one would have expected to see dehydration it has been notably absent. I may mention here that dryness of the tongue in a febrile illness seems a definite indication for dekadexolin as well as for fluids, and in my experience adequate dosage with dekadexolin will almost always prevent or abolish this distressing sign and symptom.

If what I have suggested is true these vitamins should not be regarded as being strictly part of the fighting forces of the body at all. Rather they seem to give what one might call positive health to some of the body cells, enabling them to withstand the effects of infection. They act like commissariat and medical services rather than artillery. They are not antitoxic in the way of neutralising the toxins, but they do seem to be able to render the cells more impervious to toxic effects, and probably help to repair damage. If this is so, it is only natural that their sphere of usefulness should be wide—very much wider than my limited opportunities have enabled me to explore at present. Experimental work has long suggested that this might be so. My work merely tends to show that the results obtainable in experimental work can be reproduced in actual practice by parenteral administration, whereas they may not be obtained when the vitamins are given by the mouth. In this it simply falls into line with experience of liver extracts, vitamin B_1, and other remedies. I hope that my inevitably fragmentary observations may stimulate further research to demonstrate the exact part played by each vitamin when so administered, and to delimit their spheres of usefulness. I would suggest particularly further use

in nervous diseases, and I believe that dekadexolin might prove valuable in lessening the pulmonary damage caused by irritating gases.

For the general practitioner, however, I would sound a word of warning. While I believe the product would be of much help in many conditions, it is not one to be given light-heartedly. Though in about 50 per cent. of cases it causes no discomfort at all if the patient is in bed, the injections can be quite uncomfortable and even painful if given repeatedly. In serious cases this is of little consequence, but it is far otherwise if it has been given to treat an ailment which is satisfactorily treated in other ways.

SUMMARY

A concentrate of vitamins A and D suitable for parenteral injection is described.

An account is given of the benefits apparently obtained by injection of this product in a large variety of conditions encountered in general practice.

Clinical improvement is almost always observed in suitable cases, and administration of vitamins A and D by injection should receive wider trial.

I should like to express my thanks to the directors and staff of Glaxo Laboratories Ltd. for supplying much of the Dekadexolin gratis, and for much help in its preparation and use.

Winsford, Cheshire.

LEPTOSPIROSIS IN GLASGOW TRIPE-WORKERS

WITH REPORT OF A POSSIBLE CASE OF *Leptospira canicola* INFECTION

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Weil's disease (*Leptospira icterohæmorrhagiæ* infection) is being increasingly recognised in this country and is often associated with certain occupations or activities. Thus epidemic and endemic infections have been recorded in miners (Buchanan 1927), in sewer-workers (Fairley 1934, Alston 1935), and in fish-workers (Davidson and others 1934, Davidson and Smith 1936, Smith and Davidson 1936). Damp working conditions and the prevalence of rats are common factors.

The present investigation deals with infections occurring among tripe-workers in Glasgow. These are women employed at the corporation meat market to clean, scrape, and prepare tripe. As will be seen later, working conditions are wet, rats are numerous, and the workers are very liable to minor cuts and abrasions of the hands from the instruments used in their employment. Individual cases of Weil's disease in slaughter-house workers are mentioned by Buchanan and by Schüffner (1934); apparently such cases have occurred mainly on the Continent and no information has so far been obtained about any comparable investigation in this country. The disease was first noted in September, 1937, with the admission to the Royal Infirmary, Glasgow, of a female tripe-dresser.

CASE REPORT

A woman aged 23 was admitted on Sept. 16th. She had been employed for 8 years as tripe-scraper at the corporation meat market. Her illness began suddenly on Sept. 9th with shiver and headache. These symptoms continued for the next few days and were accompanied by considerable prostration, occasional bilious vomiting, and constipation. Jaundice developed on Sept. 15th. On admission she was moderately jaundiced and showed numerous small purpuric spots on chest, abdomen, and legs. Many minor scars were present on both hands and a more recent wound was seen on the dorsum of the right hand due to a cut received at work about a fortnight before she became ill. Chief complaint was a dull frontal headache. Temperature 101° F., pulse-rate 86, respirations 22. A leucocytosis of 19,800 was demonstrated soon after admission and a direct positive van den Bergh on Sept. 21st. She ran an irregular pyrexia for 20 days, but improvement in general conditions was progressive and she was discharged well on Oct. 26th.

Bacteriological investigations.—Serum was tested by Schüffner's method for the presence of antibodies, and urine was examined on various occasions by direct dark-ground microscopy and by guinea-pig inoculation for the presence of leptospira. The results are given in Table I. Guinea-pigs were inoculated intraperitoneally with the deposit and 1–2 c.cm. of the supernatant fluid of centrifuged urines. Occasionally one guinea-pig was inoculated with more than one specimen for economy, but separate animals were each inoculated with one of two specimens received on the 21st day of illness. The second specimen was obtained 2 hours after the first in case prolonged exposure to the antibodies, demonstrated in the bladder urine, might diminish the invasiveness of any leptospiræ present. No conclusions were reached. Guinea-pig A became ill 4 days after inoculation and *L. icterohæmorrhagiæ* was recovered in culture from heart blood on the 5th day. The animal never showed any jaundice and recovered completely. It was killed 41 days after inoculation, when it gave a positive sero-reaction to a titre of 1:100. Leptospiræ were recovered in culture from the kidneys, but were not found in culture or in Levaditi stained preparations from the liver and suprarenals. Guinea-pig B died after heart puncture on the 4th day after inoculation. Leptospiræ were not recovered in culture, and another guinea-pig inoculated with a suspension of its liver and kidneys remained well. Guinea-pigs C and D remained well and leptospiræ were not recovered by successive heart punctures during life nor demonstrated in stained preparations after death.

TABLE I—BACTERIOLOGICAL INVESTIGATION

—	Day of illness.	Direct exam. for leptospira.	Schüffner's sero-reaction.		Result of guinea-pig inoculation.
			Agglutination.	Lysis.	
Blood	11th	—	1:1,000	1: 3,000	—
	28th	—	1:3,000	1:10,000	—
Urine	11th	0	<1: 4	<1: 4	—
	15th	0	1: 4	1: 8	Pig A; leptospira recovered.
	18th	0	1:32	1:64	Pig B; none found.
	19th	0	1:16	1:64	
	20th	0	1:32	1:64	Pig C; none.
	21st	0	1:16	1:64	
	21st	0	1:16	1:64	Pig D; none.

— = not done.

General Investigation

On inquiry it was discovered that the number of workers employed in scraping and preparing tripe varied from about 15 women and girls in the summer to about 40 in the winter. In addition it was found that there was a continual drift from the occupation owing to marriage and other reasons, and that there was therefore a great individual variation in the duration of such employment. At the time of this

investigation there were 28 employees in the tripe-scraping department and these fell naturally into three groups:—

(A) Girls, aged 16 to 30, in more or less continuous employment up to the present time. Some of them had been very recently engaged.

(B) Women, aged 33 to 43, employed as tripe-scrapers in the past, who had been away from this employment for a period of 7–16 years (married, &c.) and who had been recalled for temporary work.

(C) Male workers in the tripery, not employed as tripe-scrapers.

Blood was obtained from all these people and was investigated serologically. The results are given in Table II and include the case recorded above. There

TABLE II—SEROLOGICAL RESULTS IN 29 TRIPE-WORKERS

Group.	Cases.	Years employed as tripe-scraper.	Positive sero-reaction to *L. icterohæmorrhagiæ*.
A	6	Under 6/12	1
	6	1	0
	5	1– 5	0
	4	5–11	2*
B	5	5–12	2
C	3	—	0

* Includes reported case.

was evidence of infection in 3 out of the 21 persons in Groups A and 2 of the 5 persons in Group B. The three workers in Group C were negative. Prior to the serological investigation particulars of previous illnesses were obtained from all the workers and these were supplemented in some cases by later inquiry. The following details refer to people with a positive sero-reaction.

GROUP A

Case 1.—Admitted to hospital as scarlet fever one year ago; had a mild pyrexia lasting two days after admission and was discharged after six weeks with an altered diagnosis of tonsillitis and influenza. No jaundice.

Case 2.—Initial case referred to above.

Case 3.—Fairly severe "influenza" four years ago.

GROUP B

Case 4.—Very severe influenza "long time ago" during her initial period of employment. Headache was prominent—no jaundice remembered.

Case 5.—Twelve years ago illness started with severe weakness, cough, and pain in chest; diagnosed pneumonia. Off work three weeks.

It is not possible to say if these case-histories are pertinent. Undoubtedly a very large percentage of cases of Weil's disease can occur without jaundice (60 per cent.—Schüffner 1934), and are often mistaken for influenza.

INVESTIGATION OF WORKING CONDITIONS

The tripery, where these women worked, was situated in the meat market, which was associated with the cattle market and the abattoir. The area of ground covered by this building was in an industrial zone where numerous warehouses and stores were found and some offensive trades were carried on. It was served by an underground railway which formed a free passage-way for the migration of rats, and the market in general undoubtedly had a very great attraction for these animals. The tripery itself was a large ground-floor work-room with white-tiled walls. The floors were concrete and no double walls or partitions were present to give harbourage to rodents. The tripe-scrapers worked at wooden benches constantly flooded with water and the nature of their tasks exposed them to frequent minor cuts and abrasions. The floors, benches, &c., were also thoroughly hosed down every night after work and the general impression was of an exceptionally clean and well-managed establishment. There was, however, distinct evidence that rats were present in considerable numbers during the night and the market rat-catcher averred that the local rats held a sort of Parliament in the tripery after working hours. In consequence benches and floors were certainly contaminated with rats' urine and presumably with leptospiræ during that time.

Washings from benches and floors were examined for the presence of *L. icterohæmorrhagiæ* by the method suggested by Applemann (1934). Young guinea-pigs whose bellies had been shaved and scarified lightly were placed for one hour in buckets containing the washings heated to 32° C. A number died immediately from exposure, but the remainder showed no evidence of infection either in life or at post-mortem and their sera did not show the development of any antibodies to *L. icterohæmorrhagiæ*. Similar methods were used with success by Davidson and others (1934) but Schüffner states that experimental infection of guinea-pigs from such materials is difficult except in the presence of very numerous leptospiræ.

EVIDENCE OF INFECTION IN RATS

Twelve rats were caught by trap in the tripery itself; of these 5 were adult or young adults and 7 were very small. A positive sero-reaction was given by 9 to *L. icterohæmorrhagiæ* in dilutions ranging from 1:30 to 1:30,000. Antibodies were not found in the urine of any of these rats. Pieces of kidney were cultured in Schüffner's medium, suspensions of the same organ inoculated into guinea-pigs, and further portions retained for histology. *L. icterohæmorrhagiæ* was recovered in direct culture from two of the rodents and of the equivalent guinea-pigs one died with typical Weil's disease, the other was ill but recovered. The remaining guinea-pigs showed no definite evidence of infection, but the necessity of using immature animals for single tests was not appreciated at the time. Leptospiræ were found in Levaditi-stained sections of kidneys from 8 of the 9 rats serologically positive and were absent in those serologically negative. In the animals with high titres, all older rats, masses of leptospiræ were readily found, lying chiefly within the lumen of the convoluted tubules. Such rats must have been excreting very large numbers of organisms. Another two adult rats were obtained from the main market and both were positive by sero-reaction and by histology. Guinea-pigs were not inoculated and cultures, unfortunately, were contaminated. From these findings, however, it seems feasible to regard a positive sero-reaction in rats as evidence of infection.

DISCUSSION

The association of damp conditions with the presence of rats has again proved to be ætiologically associated with human leptospirosis. Such infections occur in Glasgow in the occupation of tripe-scraping in spite of the very good working conditions, but has not been recognised till the present. The degree of infection is difficult to assess. Many of the workers are seasonal and there is a continual drift from the employment, which means that a large number of people are exposed to risk for a short period. No record has been found, however, of any serious illness or death in recent years among such women.

It is, of course, being increasingly recognised that jaundice is not necessarily evident in leptospirosis—Schüffner with his extensive experience records it in about 40 per cent. of all cases—and moderate and mild cases can readily be diagnosed "influenza" or "P.U.O." Of the 26 women employed as tripe-scrapers at the time of this investigation 5 showed evidence of present or past infection with *L. icterohæmorrhagiæ*; 2 of the 5 (Group B, Table II) must have been infected over twelve and fifteen years ago. The high incidence of positive sero-reactions in these older workers recalled temporarily is particularly interesting because the tripery was undoubtedly much more rat-infested at the time of their original employment there than it is now. Extensive alterations have been carried out in recent years, superfluous woodwork removed, floors concreted, &c., and although this has not prevented rats entering the building it must have limited their numbers considerably. The rat population is heavily infected, and although a steady campaign is carried out by trapping—poison cannot be used on account of the nature of the work—it is doubtful if the results will ever be quite satisfactory. Further precautions are now being taken particularly to eliminate possible overnight contamination of benches and floors before work is commenced in the morning and to deal with all cuts and scratches when they occur.

It is of interest, also, that the initial case recorded here occurred at a time when the concrete floor was broken in parts owing to structural alterations and the entry of rats made easier in consequence, and that symptoms developed about a fortnight after a fairly severe cut on the hand which would have facilitated the entry of leptospiræ.

Possible Occurrence of *Leptospira canicola* Infection

Leptospira canicola morphologically resembles the classical *L. icterohæmorrhagiæ* (Weil) strain, but can be distinguished serologically and so far as is known is carried solely by dogs. In these it produces a chronic renal infection often fatal but occasionally very mild and even symptomless. It is excreted in the urine. Human cases have been recorded in Holland; the organism has been recovered from the urine and positive sero-reactions of 1 : 1000 to 1 : 10,000 to *L. canicola* have been demonstrated (Roos and others 1937). A variable degree of cross-agglutination with *L. icterohæmorrhagiæ* (Weil) occurs but seldom leads to confusion and can be removed by absorption with the latter organism. *L. canicola* apparently does not affect the liver either in man or animals and jaundice, accordingly, is never seen. The actual illness is generally much milder than typical Weil's disease and no deaths have been reported; it may resemble influenza, occasionally with some meningitic symptoms, but is apparently very variable in character and impossible to recognise clinically (Schüffner 1934, Schüffner and Walch-Sorgdrager 1937, Roos and others 1937). Up to last October, 12 cases have been recorded in Holland (Schüffner 1938—personal communication) but so far as I can determine none in any other country. The possible case in my series was discovered in Group B of the tripe-workers (Table II). She was a healthy woman, aged 43, whose serum gave a positive sero-reaction to *L. canicola* in a dilution of 1 : 40 and was entirely negative to *L. icterohæmorrhagiæ* (Weil). Non-specific effect due to infection with the latter organism is ruled out by the absorption experiment shown in Table III. This was repeated twice with identical results. Further it has been shown by Smith and Davidson that non-specific sero-reactions do not occur in the absence of leptospiral infection; in their 403 control sera they were unable to demonstrate any agglutination or lysis either to *L. icterohæmorrhagiæ* or to *L. canicola* even in dilutions as low as 1 : 10. My own findings with about 200 sera are in entire agreement. In the present case the sero-reaction though in a low titre was very distinct and definite. Smith and Davidson instance a case of recognised Weil's disease in which the serum titre to *L. icterohæmorrhagiæ* fell from 1 : 1000 to 1 : 30 in little more than a year after initial illness, and

TABLE III—RESULT OF ABSORPTION EXPERIMENT

—	*L. icterohæmorrhagiæ.*	*L. canicola.*
Titre of untreated serum ..	0	1 : 40
Titre of serum after absorption with—		
(1) *L. icterohæmorrhagiæ*	0	1 : 40
(2) *L. canicola*	0	0

Schüffner records a titre of 1 : 300 to *L. canicola* only six months after infection. The persistence of such low-titre reactions for many years after Weil's disease is well recognised; I have found a positive titre of 1 : 300 in a person in whom a clinically typical Weil's disease occurred 28 years ago. Accordingly it is probably justifiable to assume that such findings will be common to all leptospiral infections. In this case the woman herself could remember no definite illness, but with a disease so protean in its manifestations this means nothing. (Smith and Davidson found evidence of leptospiral infection in 18 cases with no pertinent clinical history.) She had kept dogs in her home but could not remember any being ill. From what we know of *L. icterohæmorrhagiæ* infection, however, I feel that considerable evidence has been produced in favour of this woman having suffered at some time in the past from a clinical or subclinical infection with *L. canicola*.

A second specimen of blood obtained three months later was still positive to approximately the same titre, but this time the serum was clouded with lipoid material and the tests were difficult to read in low dilutions.

Summary

A case of leptospirosis, Weil's disease, in a tripe-worker is recorded and evidence is given of such infections having occurred in 4 out of 25 other tripe-workers. Of 14 rats caught in the building where cases occurred 11 showed infection with *L. icterohæmorrhagiæ*.

Evidence suggestive of *L. canicola* infection has been found in one human case.

I wish to thank Prof. A. W. Harrington, Glasgow Royal Infirmary, for the clinical details of the case recorded; Dr. A. S. M. MacGregor, medical officer of health for Glasgow, for arranging facilities for the investigation; Dr. T. McGowan of the public health department for his personal help; and the officials of the corporation markets department for their helpfulness and courtesy.

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TREATMENT OF PERIPHERAL VASCULAR DISEASE BY INTERMITTENT VENOUS OCCLUSION

A NEW, SIMPLE, AND INEXPENSIVE METHOD

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A METHOD has recently been introduced by Collens and Wilensky (1936a and b) for the treatment of peripheral vascular disease by intermittent venous occlusion. In a subsequent paper (1937) they have described the results of this treatment in 124 cases.

The principle of the method depends on the increase in blood flow through a limb (reactive hyperæmia) which occurs immediately after a period of venous occlusion. Even though repeated circulatory occlusion and release may not increase the total blood flow through the limb over a given period of time the production of a series of waves of hyperæmia may be expected to increase the blood-supply to devitalised areas, and if sufficiently long continued to encourage the development of a collateral circulation.

The method devised by Collens and Wilensky consists in the production of venous occlusion for a two-minute period followed by a two-minute interval of circulatory release.

Their apparatus consists of an electrically driven pump fitted with an alternating mechanism and timing device. In patients suffering from peripheral vascular disease without ulceration or gangrene intermittent venous occlusion is continued for up to 12 hours a day, using an occluding pressure of 80–90 mm. Hg. When there is ulceration or gangrene, treatment is given during alternate hours, with intervening periods of rest, and an occluding pressure of 40–50 mm. Hg is used.

The results reported by these authors appear very encouraging. Their series includes cases of thrombo-angiitis obliterans, arterio-sclerosis (non-diabetic and diabetic), and embolism or thrombosis of a major artery to a limb. In a large percentage of cases they report marked improvement in intermittent claudication, the healing of gangrenous ulcers, and the relief of rest pain.

A wider adoption of this form of treatment is hampered by the following considerations:—

(1) The apparatus described by Collens and Wilensky is too expensive to be widely used, so long as the method is still in the experimental stage.

(2) The results of conservative treatment in peripheral vascular disease are so difficult to control that the claims of any new method of therapy meet with inevitable and not unjustifiable scepticism.

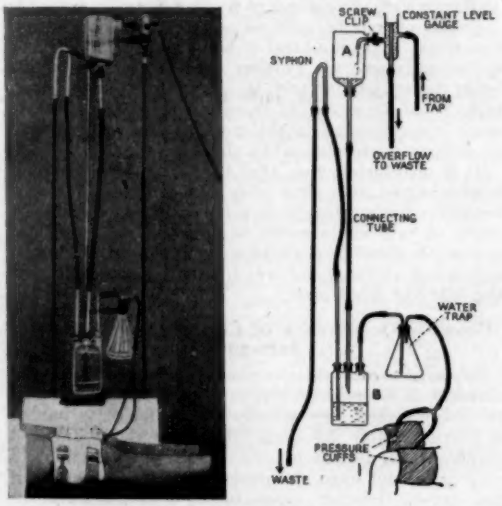
(3) In the great majority of cases of peripheral vascular disease we can hope for no lasting cure, and treatment must therefore be prolonged. This imposes a heavy burden on clinics where treatment of these patients is undertaken.

DESCRIPTION OF APPARATUS

The apparatus [1] described below is devised to meet these difficulties. It is inexpensive and can be constructed in any laboratory. It is simple in application and makes it possible for independent observers to investigate a large series of cases. Moreover it is comparatively silent in action, a factor of importance in a hospital ward. Finally it can be operated by the patient in his own home if running water is available.

Venous occlusion is produced by hydraulic pressure, intermittent action being brought about by an automatic syphon.

The apparatus (Figs. 1 and 2) consists of two reservoirs (A) and (B) between which runs a connecting tube. The upper reservoir is an aspirator bottle, the upper neck of which is left open and admits the delivery tube from the constant-level gauge. The lower reservoir is a Woulfe's bottle with which are connected a syphon, the top of which is level with the upper reservoir, its free end running to waste, and the water trap. The pressure cuffs are connected to the water trap. The constant-level gauge consists of an inflow tube which connects with the water-supply, an overflow which runs to waste, and a delivery tube, the rate of flow through which is controlled by a screw clip fixed on a rubber connexion.



The apparatus.

Components.—Aspirator bottle: 32 oz. (or an ordinary glass bottle with the bottom cut off may be used).
Woulfe's bottle: 32 oz.
Water trap: 1 litre conical flask.
Connecting tube: glass tubing and rubber tubing of 3/8 in. internal diameter. Any required pressure may be obtained by altering the length of the connecting rubber tube (and at the same time adjusting the length of the proximal limb of the syphon). The lower end of the connecting tube is ground obliquely to prevent the formation of an airlock in the bottle.
Syphon: glass tubing and rubber tubing of 5/16 in. internal diameter. The bend should be acute and flattened at the angle.
Cuffs: 5 in. wide. Upper border 18 in.; lower border (with entry tube) 16 in.
Connecting tubes to cuffs: 1/8 in. by 3/8 in. pressure tubing.
Constant-level gauge as illustrated; delivery tube into Woulfe's bottle 3/16 in. internal diameter.
The apparatus is mounted on a retort stand 56 in. high.

Mode of action.—Water is run through the constant-level gauge into the upper reservoir and then flows down the connecting tube into the lower reservoir. After the water level rises above the lower end of the connecting tube air is displaced via the trap into the pressure cuffs. When no further expansion is possible in the cuffs, water rises in the connecting tube and simultaneously in the proximal limb of the syphon. The pressure in the cuffs now rises rapidly until the connecting tube fills to the top. Thereafter the pressure rises very slowly until the upper reservoir fills to the level of the top of the syphon: at this point the syphon comes into action and the upper reservoir, connecting tube, and lower

[1] The apparatus (with one pressure cuff) is obtainable from Messrs. Baird and Tatlock, Cross-street, E.C.1, price £2 17s. 6d.

reservoir all empty rapidly. A rapid fall in cuff pressure is thus brought about and the whole cycle starts again.

Adjustment.—The compression time is the interval between filling and emptying of the connecting tube. It can be increased or decreased by raising or lowering the syphon relative to the level in the top reservoir—e.g., if the syphon is lowered there is less filling of the upper bottle before the syphon comes into action and the compression time is shortened. The decompression time is the interval between emptying and filling of the connecting tube. It can be increased or decreased by lowering or raising the proximal syphon tube—e.g., if it is raised the lower bottle fails to empty completely and therefore fills more quickly and the compression time is shortened. Finally, it is possible by means of the screw clip to alter the rate of inflow and thereby lengthen or shorten the whole cycle. A fairly rapid rate of flow is desirable to ensure rapid filling of the connecting tube and to produce a pressure-head in bottle (A) sufficient to bring the syphon into action. Once the correct time intervals have been fixed for the apparatus, no subsequent readjustment is necessary—unless the number of cuffs is increased—since the constant-level gauge and control clip ensure the same rate of flow whenever the apparatus is in operation. The pressure within the cuff is determined by the difference in the water levels in the reservoirs after the connecting tube is full.

Water trap.—The purpose of the trap is to prevent water from being driven into the cuffs as the pressure rises. This precaution is particularly necessary if two or more cuffs are used. When the pressure falls, water syphons back from the trap into the lower bottle. The bottom of the trap must be level with the top of the bottle. If the trap comes into action the pressure within the cuffs is equal to the difference in the water levels in the trap and in the upper reservoir when the connecting tube is full.

WORKING INSTRUCTIONS

(1) It is essential for the proper working of the constant-level gauge that water should be continually running down the overflow tube.

(2) The outflow limb of the syphon should be as nearly as possible vertical throughout its length, the lower end being well below bottle (B) and clear of any obstruction to the outflow—i.e., it must not be coiled up in the sink.

(3) The cuffs must be applied firmly to the limb and fixed by a broad canvas band with buckles and straps (or by adhesive tape) to minimise expansion. They must not be tight enough to produce venous obstruction.

(4) If intermittent venous occlusion is to be applied to both lower extremities two large cuffs (18 in. by 5 in.) may be applied to the thighs and connected by a Y-piece. If two patients are to be treated at the same time, the right-angled outlet tube from the trap should be replaced by a T-piece. If however more than two cuffs are required a smaller size should be used to minimise expansion—e.g., sphygmomanometer cuffs may be used and applied below the knee. As several yards of connecting tubing may be necessary, fairly narrow bore, thick-walled rubber tubing must be used (see Components).

(5) After use the apparatus should be allowed to empty before it is turned off and the cuffs are removed.

(6) Should the syphon for any reason cease to act, the pressure tube to the cuffs should be disconnected to avoid the risk of prolonged venous occlusion.

RESULTS

During the last six months the apparatus we have described has been used in 10 cases of peripheral vascular disease; 8 of these were treated for intermittent claudication and 2 for gangrene of the toes. Our only modification of Collens and Wilensky's procedure has been to lengthen the decompression interval to 4 min., since flushing of the skin of the toes may take 1½–2 min. to develop after circulatory release in some cases.

Although the series is far too small to permit any definite conclusions, the results have been sufficiently encouraging to warrant further trial. All the patients with intermittent claudication have shown an increased walking capacity during treatment. As Collens and Wilensky point out however (1936c), there is a tendency for these cases to relapse after intermittent venous occlusion is discontinued. In patients with claudication, therefore, treatment at home is specially indicated and the daily duration of treatment should be regulated according to the degree of disability. If ulceration or gangrene is present, home treatment is inadvisable unless strict supervision can be exercised.

SUMMARY

A new form of apparatus is described for the treatment of peripheral vascular disease by intermittent venous occlusion. The apparatus is simple, inexpensive, and can be operated by the patient in his own home.

We should like to express our gratitude to Prof. Arthur Ellis, under whose direction these investigations were made.

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CORRECTION OF ALAR DEFORMITY IN CLEFT LIP

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THOSE who undertake the primary or secondary repair of cleft lips will be aware that one of the most difficult of the many deformities to cure is the flat or crumpled nostril and the distorted nose tip, which always occurs when the alar base on the cleft side is raised to its correct position and approximated to the columella. Many methods have been proposed for its cure, notably those of Blair and Brown (1931) and Gillies and Kilner (1932). The former depends on a complete separation of the flattened nostril and its implantation at a higher level; the latter involves a half-columellar shift upwards and medial rotation of the alar base by means of a transposed flap of skin. None of these methods, however, appears to me to strike at the essential anatomical basis underlying the deformity, which is an asymmetrical alignment of the lateral and alar cartilages in relation to the deviated septum and to the two layers of skin between which they lie. All of them have aimed at soft-tissue readjustment in order to camouflage the cartilaginous defect. The best that could be hoped for was a nose tip symmetrical from the front but not from below.

ANATOMICAL CONSIDERATIONS

In addition to the septum itself the cartilaginous framework of the nose consists of the two lateral expansions of the septum or lateral cartilages, which support the side walls of the nose in its middle third, and the two alar cartilages, which are responsible for the support of the tip and the even contour of the

nostrils (Figs. 1 and 2). Any irregularity of these five cartilages either in shape or position is immediately reflected in a loss of external contour of the nose itself. Careful palpation of these supporting structures in the unoperated case of unilateral cleft lip (Fig. 3) shows that their normal symmetrical arrangement is grossly disturbed for the following reasons:—

FIG. 1.—Normal relationship of alar cartilages viewed from below.
FIG. 2.—Normal relationship of alar and lateral cartilages viewed from in front.

(1) Deviation and tilting of the septum to the sound side, produced by its attachment to the larger maxillary element, causes a definite displacement of the lateral cartilages and a tilting of the alar cartilages.

(2) Maxillary under-development on the cleft side allows the corresponding alar to be dragged downwards, outwards, and backwards and grossly upsets the cartilaginous symmetry of the two sides. On the sound side the cartilages will be found to be in reasonably normal position and the alar curve adequate, except for a certain amount of tilting due to the septal deviation. On the cleft side, however, the lateral and alar cartilages are displaced downwards upon the septum and columella, moderately in the case of the lateral cartilages, but considerably in the case of the alar cartilages. The amount depends upon the degree of underdevelopment of the underlying maxilla and on the severity of the septal tilt. The worse these features are—i.e., the wider the bony cleft—the greater the pull on the ala, and the flatter both it and the nose tip on that side will be. Thus the medial crus, the intercrural angles, and the vestibular vault on the cleft side are set at a lower level than the corresponding side, while the lateral crus, instead of being delicately curved towards the base of the columella, is quite flat across the cleft.

When, however, the primary repair of the cleft lip is carried out, a new series of deformities is produced entirely due to the operation. Approximation of the alar base to the septum and columella and equalisation of the alar basal levels do not by themselves raise the depressed intercrural angle or produce an outwardly curved nostril. The result is always a crumpled nostril with a deep depression just above the middle third of the lateral crus and with a corresponding fold of vestibular skin running from the vestibular vault obliquely downwards, backwards and outwards to the floor of the nose. If as so often happens the alar bases on the two sides have not been equalised or that on the cleft side sinks post-operatively, a further deformity makes its appearance. This is a gradual twisting forwards of the alar cartilage at its intercrural angle so that in addition to being set at a lower level it approaches the tip of the nose and so distorts the curve of the lobule and re-entrant angle of the nostril to produce a distinct angular droop on that side (Figs. 4, 5, 6).

The occurrence of these secondary defects that follow repair of the lip is to be explained as follows:—

The ala nasi consist of a central layer of inelastic cartilage sandwiched between and tightly adherent to two layers of skin. The outer of these is densely fibrous, inelastic, and thick; the inner is thin and rather more elastic. The ala on the sound side develops in the curved position, that on the cleft side in the flat. It is obvious that developmentally the relative positions of cartilages and skin must be different in each nostril. Any attempt to reproduce the gracefully curbed ala of the sound side by merely bending the flat ala on itself is certain to result in distortion unless the relationships of the cartilage and skin are permitted to alter for the new position. Owing to the tight and inelastic union between them this cannot occur naturally. But if the various layers of the cleft ala can be made to slide upon each other by other means then the entire structure should assume by itself a normal position.

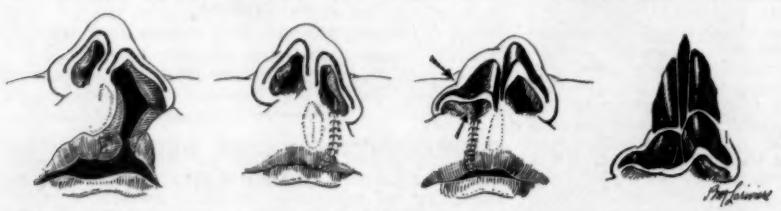

FIG. 3.—Cleft lip. Alar cartilage on cleft side depressed below that on sound side. Lateral crus flat, intercrural angle broad.
FIG. 4.—Repair of lip with alar base below level of sound side, secondary distortion of depressed alar cartilage.
FIG. 5.—Repair of lip with alar bases at same level. Twisting and secondary distortion of alar cartilage with skin fold internally.
FIG. 6.—Front view. Alar and lateral cartilages on cleft side depressed below level of those on the sound side. Nose tip distorted.

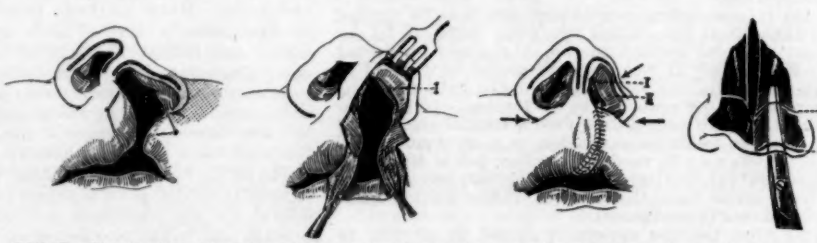

FIG. 7.—Repair of lip with undermining of alar base, and preparation of flaps for floor of nose.
FIG. 8.—Circumferential incision I, between alar and lateral cartilage with undermining of lateral cartilage along lower border.
FIG. 9.—Repair of nasal floor and ligament of alar bases. Circumferential incision II lower border of alar cartilage.
FIG. 10.—Undermining of alar cartilage to form "bucket handle" flap between incisions I and II.

This has long appeared to me to be the true explanation of the flat and crumpled ala and in support of it I present an operation which, by fulfilling these requirements, actually produces a symmetrical nose tip and a nostril on the cleft side indistinguishable from that on the sound side when viewed from any position.

TECHNICAL DETAILS

Since the particular point of technique that aims at symmetry is simply a part of the repair or reconstruction of the cleft lip, it is unnecessary to refer to the operative details associated with the lip itself other than to lay the foundations for the alar repair.

It is assumed that the cleft has been pared, the lateral nasal and septal mucosal and skin flaps have been prepared for the floor of the nose and the alar base has been thoroughly mobilised by wide undermining and elevation of the tissues from the surface of the cleft maxilla (Fig. 7). At this point a vertical incision (Fig. 8, Incision I) is made in the skin lining the cleft ala between the lateral and alar cartilages extending from the cleft itself circumferentially round the vestibule across the vault and on to the septum along the upper border of the medial crus of the alar cartilage for one-third its length. In certain cases the lateral cartilage is undermined superficially for a short distance along its lower border (Fig. 8). The floor of the nose is now reconstructed and the alar base approximated to the septum and columella, care being taken to see that the level of the latter is identical in every respect with that of its fellow on the opposite side. The lip itself is then completely repaired in the usual way.

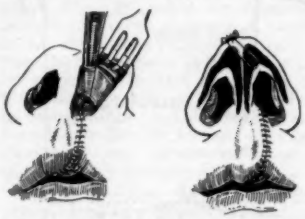

FIG. 11.—The "bucket handle" skin-cartilage flap from below.
FIG. 12.—Fixation of the alar cartilage after re-establishment of vestibular vault.

The uniform result of this is that in primary cases the typical crumpled ala is produced, while in secondary cases the already existing deformity is increased by raising the level of the alar base. The final correction of this deformity is as follows:—

With a No. 10 Bard Parker blade another circumferential incision (Fig. 9, Incision II) is made just within the edge of the ala and outside the lower margin of the alar cartilage beginning at the junction of the middle and lower thirds of the lateral crus and continuing round the re-entrant angle of the nostril on to the columella and along the lower edge of the upper third of the medial crus. A pair of fine curved blunt-pointed scissors (Fig. 10) or a No. 10 Bard Parker blade is then thrust through this lower Incision II, between the cartilage and the external skin and made to emerge into the vestibule through Incision I. The alar cartilage is then carefully separated from the external skin between the limits of these two circumferential incisions. In this way a "bucket handle" flap of almost the entire alar cartilage lined with vestibular skin is mobilised just inside the nostril attached medially to the upper part of the septum and columella and laterally to the alar base (Fig. 11).

As soon as this manœuvre is complete it will be found that the crumpled appearance disappears and the tip of the nose on the cleft side now freed from its attachment rises to its normal position, while the alar cartilage now free to rotate medially rises into the vestibular vault and reproduces the corresponding cartilaginous curve exactly. In the primary cases it is usually unnecessary to do more than this, fixation being quite superfluous. In the reconstruction of secondary cases, however, associated defects may now be easily remedied. Thus the droop at the re-entrant angle of the nostril produced by the twisting of the depressed cleft cartilage can be cured by rotating the "bucket handle" upwards, by excising a section of the lower border of the lateral cartilage previously undermined, to accommodate its upward shift, and by trimming a small section from the lower border at the intercrural angle to correspond with the other side. In a variety of ways symmetry of the alar can thus be assured. As a fixation in cases where much adjustment has been necessary, I am in the habit of inserting a mattress suture (Fig. 12) through the vestibular vault on the cleft side, bringing it out and tying it over a small dental roll placed over the intercrural angle of the opposite cartilage. This is removed on the fourth or fifth day. Occasionally a few lateral mattress sutures are used to secure the cartilage and skin in the new position and the edge of the nostril rolled in to correspond more exactly with the opposite side.

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GENERALISED OSTEITIS FIBROSA
DUE TO A RETRO-ŒSOPHAGEAL PARATHYROID TUMOUR

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THE following case of generalised osteitis fibrosa due to a parathyroid tumour is recorded in order to emphasise the very advanced stage the disease may reach before being suspected, and the importance of making a thorough search for the parathyroid tumour if it is not found in the usual situation.

CASE REPORT

The patient was a girl, aged 19, who was admitted to St. Alfege's Hospital, London, on Dec. 8th, 1935, complaining of pain in the chest.

She had been quite well till about the beginning of the year, when her mother noticed that the end of the right clavicle was prominent. At the same time she began to get pain in the right arm, which left it numb, and she gradually lost the use of that arm. A reconstruction of the sternoclavicular joint was performed in the orthopædic department of another hospital in March, 1935, but following the operation she began to have pains in both arms and legs sufficiently severe to keep her awake at night. She had been unable to walk properly on account of pain and muscular weakness since the operation, and had noticed that her bones were slightly tender. In November she began to have pain on the left side of the chest, which was made worse by coughing, and was admitted for investigation. Apart from a poor appetite and constipation, there were no symptoms referable to other systems.

On examination she was found to be a pale, sallow complexioned girl, who was unable to stand alone. No definite physical signs were found in the chest, except slight lagging of the left side on respiration. Muscular power was generally very poor: she could only just lift her legs off the bed, and not at all against resistance. The bones were slightly tender on palpation. No abnormal physical signs were found elsewhere. The urine was normal, and did not contain Bence-Jones protein.

Radiography (Dr. K. J. Yeo) of the chest on Dec. 10th showed several small rarefied areas in the ribs on the left side, and rather thin clavicles, with a ragged appearance at the outer end of the right clavicle; no evidence of disease was found in the lungs.

Subsequent X ray examinations on Dec. 13th and 23rd, with controls from a normal individual of similar age and stature showed general decalcification, certain bones being especially affected. The skull showed general mottled decalcification, with a few larger areas of rarefaction. The pelvis was funnel-shaped with general rarefaction. There were large cyst-like areas in the iliac bones and pubis, with a partial fracture of the right pubis, and irregular and delayed union at the epiphysial junctions of both ascending rami. Both humeri showed general mottled decalcification, with thinning of the cortex. The radius and ulna on the right side showed large rarefied areas just above the wrist. The 4th and 5th metacarpals on both sides showed cyst-like rarefaction. The leg bones, especially the tibiæ, showed severe decalcification, but no cysts were seen.

Chemical examination of the blood on Dec. 16th gave typical results—a high serum calcium and plasma phosphatase, with a low serum inorganic phosphate. A balance experiment over a three-day period showed a pronounced negative calcium balance (see Tables).

In view of these clinical and chemical findings the diagnosis of generalised osteitis fibrosa due to a parathyroid tumour seemed certain, notwithstanding the observations of Robbins and Kydd (1935) that some of these changes can be observed in other conditions. It was therefore decided to explore the neck and remove the tumour. The patient unfortunately developed a respiratory infection, and it was not possible to operate until Feb. 3rd, 1936, when a parathyroid tumour was found and successfully removed. The operative technique and description of the situations where parathyroid tumours are to be expected is described by Walton (1931); further references that should be consulted are Churchill and Cope (1934) and Lahey and Haggart (1935).

FIG. 1.—Parathyroid tumour (right) with small fragment of thyroid gland attached.

Operation.—Feb. 3rd. Gas-and-oxygen and avertin anæsthesia. The thyroid gland was freely exposed by means of a wide collar incision, but no parathyroid tumour was seen. The inferior parathyroid body of each side was identified and appeared to be normal. The superior bodies could not be identified on either side. A finger was passed into the thorax on either side of the trachea, but still no tumour could be found. The region behind the œsophagus was then explored, as described by Walton (1931). The thyroid fascia, which was a well-defined layer, was divided above the inferior thyroid artery: a finger was then introduced into the space behind the œsophagus, and a tumour was easily felt lying in the midline immediately in front of the last cervical and first dorsal vertebræ. The tumour was delivered into the wound without difficulty, only a few fine fascial strands requiring separation. It was connected to the postero-lateral aspect of the thyroid by a fine pedicle consisting of two small veins, a small artery,

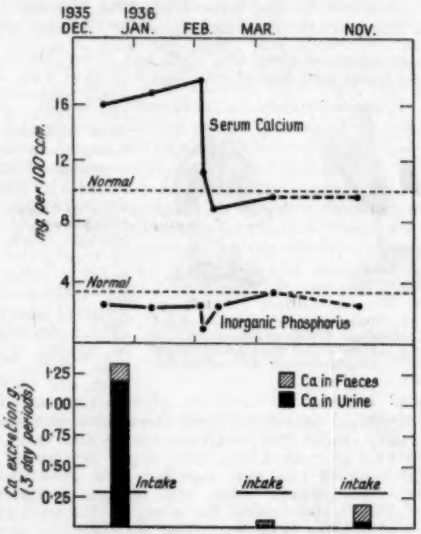

FIG. 2.—Changes in serum calcium and phosphorus, and calcium excretion before and after operation.

and a few strands of connective tissue. The tumour and a small piece of thyroid gland were removed and the wound closed with drainage. The tumour (Fig. 1) measured approximately 3 cm. by 2 cm., and was nearly 1 cm. thick; it was roughly oval and dark red in colour. The cut surface showed numerous areas of various shades of yellow.

Histological report (Dr. A. B. Bratton).—The gland is divided into ill-defined lobules by œdematous collagenous septa, which in places show a moderate infiltration with eosinophil leucocytes and a few polymorphs and plasma cells. The epithelial cells of the lobules are almost all alike in possessing a vacuolated slightly basophil cytoplasm and a spherical nucleus showing a fine chromatin net and one, or occasionally two, nucleoli; the vacuolation occasionally occupies the whole cell, the nucleus then appearing to be free in the centre of the empty cell, giving the usual appearance of a glycogen-loaded cell in formalin-fixed tissue. The cells resemble the principal cells of the normal parathyroid, but are mostly to some degree larger; in shape, size, and arrangement, however, they differ considerably in different parts of the tumour. In numerous areas cuboidal cells only slightly larger than the normal are arranged in small acini divided by capillaries; the capillary network is much less conspicuous than in the normal gland. The majority of the acini are solid, but tubular acini, either empty or containing pale eosinophil colloid-like material, are not infrequent. Occasionally the tubular acini are lined with larger, columnar, completely vacuolated cells, usually in a single row but in places two or three deep; such acini tend to occur in small groups. There are a few small areas, usually in relation to the first-named, in which the cells vary considerably in size but are all considerably larger than the normal, many having hyperchromatic nuclei. In other areas the cells are arranged in large strands, often anastomosing, which lie in an œdematous young collagenous stroma showing a few young fibroblasts and an infiltration of the same character as in the large septa but slightly greater in degree. The outer margin of the strands

is formed by a layer of columnar cells; in the majority the central part is formed by a solid mass of cuboidal cells, but in others the strands form large irregular tubules, the largest being lined with one to three layers of columnar cells, the smaller tending to show more layers. In one area there are a few small clumps of large cells with pale eosinophil cytoplasm, resembling the pale eosinophil cells of the normal gland. There are a few areas of hæmorrhage. The structure varies so much from that of the normal gland that it might be considered neoplastic, and indeed in places suggests a carcinoma, though there is no definite evidence of infiltration; no normal parathyroid tissue is however present, which would be expected in the case of a true adenoma. The picture indicates an extreme degree of activity and is comparable to the areas of atypical proliferation sometimes found in an over-active thyroid. The condition may be described as adenomatous hyperplasia of the parathyroid.

Progress.—The day after operation the patient complained of stiffness of the face and tingling in the limbs. Tetanic symptoms, with positive Chvostek and Trousseau signs, persisted for approximately 10 days after the operation. Convalescence was somewhat delayed owing to a severe respiratory infection, but 18 days after operation she was able to walk with assistance, and in 25 days alone. Her muscular power had greatly improved by this time, and though she complained of some pain on walking 6 weeks after operation, her general condition was vastly improved from that on admission. She was discharged from hospital on March 19th. She was admitted again for observation in November, 1936: there was still slight pain in the legs on walking for some time, but this disappeared after a few days' rest in bed, and was attributed to the greatly increased use of her muscles since the operation. She attended the out-patients' department in January, 1937, and was then completely well.

TABLE I—BIOCHEMICAL FINDINGS

Date.	Serum (mg. per 100 c.cm.).					Plasma phosphatase (units per c.cm.).
	Ca	Mg	Na	K	P	
Dec. 16th, 1935	15·5	..	..	..	2·3	1·1
Jan. 10th, 1936	16·4	1·9	..	..	2·15	..
Feb. 3rd, 1936	17·3	2·0	310	19·6	2·35	..
Operation (Feb. 3rd)						
Feb. 4th, 1936	11·3	1·8	297	20·3	1·1	..
„ 7th, 1936	8·7	..	..	..	2·2	..
March 6th, 1936	9·5	..	..	..	3·4	0·75
Nov. 24th, 1936	9·6	..	..	..	2·3	..
Dec. 2nd, 1936	..	..	..	..	..	0·56
Jan. 4th, 1937	9·5	..	..	..	2·5	..

TABLE II—BALANCES

Date (all 3-day periods).	Calcium (grammes).				Phosphorus (grammes).			
	Int.	Output.		Bal.	Int.	Output.		Bal.
		Ur.	F.			Ur.	F.	
Dec. 20th-23rd, 1935	0·30	1·20	0·16	−1·06	1·50	1·95	0·12	−0·57
March 4th-7th, 1936	0·27	0·01	0·05	+0·21	1·30	0·68	0·15	+0·47
Dec. 8th-11th, 1936	0·27	0·05	0·13	+0·09	1·36	1·16	0·18	+0·02

Int. = intake; Ur. = urine; F. = fæces; Bal. = balance.

BIOCHEMICAL FINDINGS
(see Fig. 2 and Tables I and II)

The serum calcium and phosphorus figures were typical of the condition. The first serum calcium figure was 15·5 mg. per 100 c.cm., rising to 17·3 mg. on the day of operation. Following operation, the level dropped to 11·3 mg. the next day and 8·7 mg. 3 days later. It remained subsequently practically constant at 9·5 mg. per 100 c.cm. The plasma phosphatase was very high (1·1 units per c.cm. by the original Kay method, which has a normal range of 0·1 to 0·2 unit) before operation, and was still above normal (0·56 unit) nine months after operation.

The serum inorganic phosphate was low throughout, except for one post-operative value of 3·4 mg. per 100 c.cm. The extremely low value of 1·1 mg. was observed on the day after operation.

Calcium and phosphorus balances were both markedly negative before operation. A month after operation there was intense retention of calcium, it being almost absent from the urine. Nine months later the calcium and phosphorus balances were normal.

The other serum kations were also determined before and after operation. There was a slight fall in the serum sodium after operation, probably due to shock, but no significant change in potassium or magnesium. There are no records of serum potassium figures after operation in parathyroid tumours, but there was no significant change in serum potassium when 80 units of parathormone were injected intravenously in a patient with periodic paralysis (Allott and McArdle 1938), although as shown by Ellsworth and Nicholson (1935), and confirmed by us, a large amount of extra potassium is excreted in the urine. Aub and Tibbetts (1937) found a slight fall in serum magnesium after operation in one case, with significant changes in the magnesium excretion. Potassium and magnesium balance studies were not carried out in this patient.

The blood chemical methods used were the same as those described in previous papers by one of us (E. N. A.). For the balance experiments the patient was placed on a measured low-calcium diet for 4 days, and then excretion was measured over a single further period of 3 days, the beginning and end of the fæcal collections being marked by carmine.

SUMMARY

A case of generalised osteitis fibrosa due to a retro-œsophageal parathyroid tumour is described. The patient had been operated on nine months previously at another hospital, where the disease was not suspected; although there was no obvious external deformity, X ray examination showed very widespread decalcification and cyst formation in numerous bones. Typical metabolic changes were found; after operation calcium and phosphorus metabolism returned to normal.

Our thanks are due to Sir Frederick Menzies, medical officer of health, and to Dr. B. A. Young, medical superintendent of St. Alfege's Hospital, for permission to publish this case.

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MEMORIAL EDITION OF PAVLOV'S WORKS.—Soon after the death of Prof. Ivan Pavlov the Soviet Government decided to publish a complete memorial edition of his works, in four languages—Russian, English, French, and German. The first two volumes will be issued this year. The former will contain Pavlov's articles and speeches on social and political subjects and his work on blood circulation; the second will be devoted to his observations on the physiology of digestion.

TYPHOID EMPYEMA
FORTY YEARS AFTER ENTERIC FEVER

By C. R. T. Lane, M.B. Camb., M.R.C.P. Lond.
CASUALTY PHYSICIAN AT ST. BARTHOLOMEW'S HOSPITAL, LONDON; AND

A. E. Francis, M.D., M.R.C.P. Lond.
SENIOR DEMONSTRATOR OF PATHOLOGY IN THE MEDICAL COLLEGE

EMPYEMA due to *Bacterium typhosum*, occurring forty years after the acute attack of enteric fever, is thought to be sufficiently unusual to justify a record of a case, together with the bacteriological findings.

CASE REPORT

A salesman, aged 54, was admitted to St. Bartholomew's Hospital under the care of Dr. F. G. Chandler on May 25th, 1937. He had always been a strong and healthy man, but remembers having had an illness in 1896, which he believes to have been typhoid fever. During the late war he had a slight attack of malaria. Two years ago all his teeth were removed on account of pyorrhœa. His general health was good.

On May 1st, 1937, he had "pleurisy" on the right side, with fever to 99° F. On May 10th the pain in the chest became more severe. Temperature 101° F., with sweats; cough, but no sputum. A week later there were signs of a pleural effusion at the right base. His doctor aspirated 15 c.cm. of clear fluid.

On admission he was flushed and looked ill. Temperature 100°–101° F. There were signs of a moderately large effusion on the right side of the chest. He had a slight cough but no sputum. There was considerable glycosuria but no albuminuria.

Treatment and progress.—May 25th: White cell count, 13,400 per c.mm.; 20 c.cm. of turbid fluid withdrawn from the right pleural cavity. June 1st: White cells, 16,000 per c.mm. (polymorphs 13,020, lymphocytes 2436, mononuclears 1092, eosinophils 252); blood-sugar, 1½ hours after a meal, 242 mg. per 100 c.cm.; 50 c.cm. of thin pus withdrawn from the chest. June 8th: White cells, 11,200 per c.mm.; insertion of intercostal catheter under Evipan anæsthesia; 250 c.cm. of pus drained; temperature returned to normal for a few days.

On June 12th, because the tissues around the catheter had become brawny and œdematous, and the amount of pus draining had fallen to 20 c.cm. a day, a rib resection was performed under general anæsthesia. A large tube was inserted and the surrounding tissues were opened up. Daily wash-outs with Dakin's solution were begun, and the temperature dropped to normal in the course of a few days. He remained afebrile until his discharge. The pus, which averaged 100 c.cm. daily for the first fortnight after the rib resection, diminished rapidly after this, and by July 1st was a mere trace. He was discharged from hospital on July 24th with a small tube in the wound, and this was removed on August 14th, the wound finally healing on Sept. 1st. He has regained 3 st. in weight and is now in perfect health.

In view of the glycosuria and hyperglycæmia, he was given 30 grammes of glucose and 30 units of insulin before the operation for rib resection. On a diet of carbohydrates 130 g., protein 70 g., fat 90 g., and 10 units of insulin twice daily, he became sugar-free in the course of a few days. His diet was subsequently increased to carbohydrates 150 g. and on discharge he was sugar-free without insulin. The urine has been tested on several occasions since then and no sugar was found.

BACTERIOLOGICAL FINDINGS

The first specimen of pleural fluid withdrawn was thin pus (May 25th), but no organisms were seen in films (Gram or Ziehl-Neelsen). Culture of a loopful yielded four colonies of a coliform bacillus, which was shown to have the biochemical characters of *Bact. typhosum*, and to be agglutinated to full titre by a typhoid serum. The second specimen (May 31st) contained 31,000 leucocytes per c.mm., nearly all polymorphonuclears, but no organisms were seen in films. The same organism was again grown. The third specimen was similar. Only three colonies were grown from a large (4 mm.) loopful.

In view of the unusual nature of the case, it was thought desirable to confirm the identity of the organism, so an agglutinin-absorption test was carried out, but satisfactory absorption was not obtained. (The titre of the serum to *Bact. typhosum* was reduced to 25 per cent. of its original value.)

The organism was therefore sent to Dr. A. Felix, who has kindly allowed us to make use of his findings. He suggested that since the culture used contained a good many non-motile organisms, the reason for the failure might have been an insufficient quantity of "H" antigen in the absorbing suspension. The Table, abbreviated from Dr. Felix's report, shows the results of agglutination tests with the patient's strain, compared with those obtained with a strain known to be rich in "Vi" antigen and also with a strain that is devoid of this antigen.

AGGLUTINATION TESTS

Strains.	"Watson" O-inagglutinable. Virulence high.	Patient's	H.901 O-agglutinable. Virulence low.
Pure H serum 1 in 2000	++	+	++
Pure O " 1 in 1000	(+)	++	+++
" 1 in 5000	−	+	+++
Pure Vi " 1 in 100	+++	+++	−
" 1 in 400	++	+++	−

Dr. Felix also examined the patient's serum for agglutinins and found the result to be:—

Vi titre against strain "Watson"	1 in 20+
O titre against strain O.901	1 in 100±
H titre	1 in 200±

He stated that the Vi titre of 1 in 20 was quite significant, and of the same order as the titres found in chronic typhoid carriers. The organism was not recovered from the patient's fæces, urine, or from the duodenal contents.

A further examination of the pus from the wound on July 8th showed a heavy growth of *Streptococcus pyogenes*, but *Bact. typhosum* could no longer be grown.

It is thought that the empyema probably resulted from a typhoid osteitis of a rib, but there was no radiological evidence of this.

We are indebted to Dr. F. G. Chandler for permission to publish this case, and to Prof. L. P. Garrod for his helpful criticism and advice.

SAFETY BOOTS.—An inquiry recently carried out in 56 Sheffield firms on behalf of the National "Safety First" Association showed that foot injuries accounted for 14 per cent. of the non-fatal accidents to the workmen. A considerable proportion of these could have been avoided by the use of a safety boot with a hardened toe-cap which would withstand a heavy weight. The British Standards Institution has been asked to draw up a suitable specification for such a boot, and will probably lay down that the toe-cap must not collapse when the maximum weight which a man can carry—about a hundredweight—is dropped upon it from the wearer's hands. It is hoped that the adoption of a standard for safety boots will encourage their general use.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTIONS OF SURGERY, MEDICINE, AND ANÆSTHETICS

AT a joint meeting of these sections held on March 2nd, Prof. G. GREY TURNER presiding, a discussion took place on

Massive Collapse of the Lung as a Complication of Surgical Operations

Mr. C. PRICE THOMAS said that atelectasis had been recognised as an entity for nearly a hundred years. W. T. Gairdner in the middle of the last century had demonstrated the morbid anatomy of the condition, suggesting that it was caused by retained secretions. Interest seemed to have faded until W. Pasteur (1908) put forward the hypothesis that the cause was diaphragmatic paralysis. In 1914 Elliott and Dingley revived Gairdner's theory, which had since been supported by experimental and clinical observations. Mr. Price Thomas regarded the re-expansion of the lobe after removal of the secretion as evidence that any secretion found occupying the bronchus of an atelectatic lobe was a cause and not a result of the collapse. Bronchial occlusion was probably not the only cause of collapse, as it did not explain about 10 per cent. of the cases. Atelectasis artificially produced by bronchial occlusion took about six hours to become established. The cases of sudden onset occasionally met with thus could not be due to occlusion. Rose Bradford's neuromuscular theory might provide an explanation of these cases; little was known of the neuromuscular mechanism of the lung. L. Brauer noticed quiescent segments of the bronchial tree during quiet respiration. This might have some bearing on the production of lobular collapse when taken together with the discovery of R. M. Waters that hyperventilation with carbon dioxide is followed by an abnormally high rate of diffusion of gases if the bronchus is occluded.

In the 90 per cent. of cases of atelectasis following operation the factors underlying obstruction were (1) the characteristically thick and tenacious secretion, and (2) the patient's inability to expel it. The bronchial glands were sero-mucous and in catarrhal affections—as after atropine or hyoscine—the serous secretion was inhibited more than the mucous. The same effect was produced by irritation from the inhalation of material such as blood clot or dental tartar. Pain and lack of muscular power diminished coughing, which was the best natural expulsive mechanism. The result of many investigations showed that the type of anæsthesia used was not important, although the combination of spinal and ether anæsthesia showed a higher rate than either alone. Preliminary narcotisation predisposed a patient to aspiration into the tracheobronchial tree. Abdominal operations showed a higher incidence than those in other regions, and operations on the upper abdomen and appendicectomy with drainage the highest incidence of all, especially in adult males; this was due to deficient diaphragmatic respiratory movements owing to pain. Infection of the bronchial tree, however slight, played an important part in the ætiology of the condition and this had a bearing on oral sepsis. Males were more prone to the complication perhaps because they were more dependent on abdominal breathing. Post-operative atelectasis generally occurred within the first 48 hours, although it might be delayed for a week. The onset was usually rapid and accompanied by a rise in pulse-rate, temperature, and respirations. Pain was usually present and sometimes severe; cough and respiratory distress of varying degree were constant features. Sputum was not usually present. The classical physical signs were dullness on the affected side with displacement of the heart to that side; the diagnosis was confirmed by X rays. Prophylaxis depended on recognition of the factors predisposing to the condition; treatment should be directed towards removal of the obstruction by stimulating the cough. Mr. Price Thomas did not advocate bronchoscopic aspiration as a general rule, expectorants being usually sufficient. In his view the administration of carbon dioxide and oxygen was of doubtful value, perhaps even undesirable, as it might result in the aspiration rather than the excretion of the mucous plug.

Dr. JAMES MAXWELL said that Pasteur's conclusions were supported by the evidence obtained during the war, reviewed by A. B. Soltau (1925). During the last ten years the conclusive demonstration that spontaneous massive collapse is due to retention of secretion with consequent bronchial obstruction had been furnished by the bronchoscope. Many factors are concerned in the production of this obstruction. M. C. Myerson had shown the importance of a protective cough in keeping the bronchial tree free from secretions, and also the tolerance of the tracheal and bronchial mucous membrane to certain material. Pre-operative medication with morphia and other respiratory depressants was therefore contra-indicated. Inability to expel a plug of mucus was the chief cause of massive collapse. That diaphragmatic paralysis alone was not the main cause in collapse of the lower lobe was proved by its rarity after phrenic evulsion. The raising of the diaphragm in established cases Dr. Maxwell regarded as secondary. In the early stages symptoms were few or lacking; later came an irritative cough, with little or no sputum, and rarely any trace of blood. A common feature was pain in the chest (which might be mistaken for pleurisy) due to sudden increase in the negative tension in the pleural space. There was always some dyspnœa. A rise of temperature, when it occurred, was apparently due to the retention of infected material distal to the obstruction and therefore suggested the possibility of developing suppuration in the collapsed area. The earliest and most important physical sign was the weakening of the breath sounds over the affected lobe; when the diagnosis is made at this stage preventive treatment might well be successful. In the fully developed condition diagnosis was not difficult, even without radiological help. The chief danger of post-operative collapse lay in its possible sequelæ—lung abscess and bronchiectasis. It was thus essential to secure re-expansion as early as possible. Every effort should be made to eliminate factors predisposing to retention of secretion. In the earliest stage of collapse inhalations of carbon dioxide were of great value. When collapse had occurred and the patient was unable to expel the obstruction by coughing, bronchoscopic aspiration should be done early rather than late.

Dr. E. H. RINK said the anæsthetic might be one among the factors leading to the condition; he personally thought that the nature of the patient and the operation were more important. In estimating the chances of collapse in any particular patient four points must be borne in mind: most of the cases

were males and followed abdominal operations, and the risk increased with age, asthenia, and an unhealthy condition of the respiratory system, including oral sepsis. The selection of a suitable time for the operation (*not* the day after admission to hospital or nursing-home) was more relevant than that of any special anæsthetic. Skilful administration and gentle operating were desirable, and after the operation tight bandaging should be avoided and the patient should be encouraged to move about and cough. Atropine increased the viscidity of the sputum, making coughing more difficult. Carbon dioxide should be used quite early in small quantities or only as a last resort. Post-operative administration of morphia in small doses helped the cough by deadening pain. Expectorant drugs did not help much in this condition.

Dr. E. H. JOULES described two cases not due to bronchial obstruction. Both had started with peritonitis which had gone on to mediastinal pleurisy, involving the phrenic nerve with resulting diaphragmatic paralysis.

Dr. RANYARD WEST working on rabbits and other animals had found that curarine can produce a sudden collapse of the lung which was thought to be due to paralysis of the bronchial as well as of the voluntary musculature. The intrapleural pressures in rabbits and cats, before and after arrest of respiration had been induced with ether, were similar to those following the injection of curarine. Posture was a factor in animals. When the head was down and the abdominal contents pressed on the diaphragm, a lower negative pressure occurred than when the head was up, but this observation might not be applicable to man, whose diaphragm was much more muscular. Pulmonary collapse during the instillation of lipiodol was analogous to a similar type of collapse which occurred in small animals, such as the guinea-pig, when blood was allowed to enter the bronchial tree. Dr. West had noticed that curarine did not so easily produce massive collapse when the animal had been atropinised.

Dr. LEONARD FINDLAY commented on the incidence of spontaneous pulmonary collapse in children.

Mr. JOHN HUNTER said that the pre-operative use of atropine—a survival from the days when open ether was the customary anæsthetic—might cause the formation of a tenacious plug of mucus. Morphia probably did no harm as it allowed of more gentle handling of the patient. Cases occurring in the first 24 hours after operation, which perhaps physicians did not often see, could generally be cured by giving carbon dioxide; in cases occurring at a later date other factors were involved, possibly sepsis.

Dr. LETHEBY TIDY said that during the war he had seen many cases in which there was no previous history of pulmonary sepsis; these might have been due to a neuromuscular phenomenon. He had also seen massive collapse in diphtheria, perhaps as a result of muscular weakness. Many cases of contralateral collapse had been recorded, mostly following quite minor thoracic injuries; possibly the condition of extreme strain under which the men had been living predisposed them to shock.

Prof. G. GREY TURNER said that the modern anæsthetist provided excellent operative conditions; that the subsequent state of the patient was often less satisfactory was perhaps chiefly due to premedication. The more restless and active post-operative patient of former days may have had more pain, but he also had more cough. Morphia should only be given if there was real pain or distress, and cough should be encouraged.

REVIEWS AND NOTICES OF BOOKS

An Introduction to Bacteriological Chemistry

By C. G. ANDERSON, Ph.D. Birm., Dip. Bact. Lond., Lewis Cameron Teaching Fellow, Bacteriology Department, University of Edinburgh. Edinburgh: E. and S. Livingstone. 1938. Pp. 278. 10*s.* 6*d.*

THE scope of this book, which is the first to reach us with a claim to be a text-book in this special field, is somewhat wider than its title indicates, since it includes also some aspects of the biochemistry of yeasts and lower fungi. This illustrates at once the difficulty of confining a text-book to a specific aspect of biochemistry; it is becoming more and more clear that there is no biochemistry peculiar, for example, to mammals, or to bacteria or yeasts, but that there is a fundamental biochemical unity based on the organic relationships of all forms of living matter.

Dr. Anderson has designed his book for the use of students taking such courses as the diploma in bacteriology of the University of London, or the honours course in bacteriology in the University of Edinburgh; that is to say, advanced courses which deal extensively with the biochemical aspects of bacteriology as well as those more directly medical. One of the problems to be faced by the author of such a text-book lies in deciding what knowledge may be assumed in its potential users. For example, in the first part of this one eighteen pages are devoted to hydrogen-ion concentration and oxidation-reduction potentials, nine pages to colloids and adsorption, and sixteen pages to enzymes. These complex subjects can hardly be covered even superficially unless the reader is credited with a certain basic knowledge of them; and if on the other hand he has had a sound training in chemistry this section is superfluous. This criticism gains force from the consideration that a good knowledge of organic chemistry is necessary to the understanding of the subjects dealt with in the remainder of the book, and no preliminary summary on organic chemistry is supplied. The second part of the book on metabolism includes chapters on the nutrition of autotrophic and heterotrophic bacteria, growth factors, adaptive and constitutive enzymes, bacterial respiration, nitrogen and carbohydrate metabolism, alcoholic fermentation (by yeasts), fermentation products of the lower fungi, and industrial fermentations. There follow chapters on the proteins (including a section on nucleic acids), polysaccharides, lipoids, and pigments of micro-organisms. Some aspects of immunochemistry are discussed in a third part, which contains a chapter on antigens, haptens, antibodies, and complement, and one on the mechanism of antigen-antibody reactions. Methods for the isolation and identification of metabolic products are described in a short appendix.

The ground covered by the book is thus very wide and the collection in one slender volume of so much information about the rapidly developing subject of microbiological chemistry is certainly an achievement. The author has not managed to escape a certain lack of correlation between various parts of the book and the presentation of some subjects (e.g., growth factors) is not always satisfactory. The classification of bacteria based on their supposed requirements of "vitamin B" is valueless; surely

it is no longer permissible to talk of "vitamin B" when aneurin (vitamin B_1), lactoflavin (vitamin B_2), and, probably, nicotinic acid, are already known as components of what used to be lumped together as the vitamin-B complex.

There is in places evidence of a failure to digest all the material that is being expounded and of uncritical acceptance of some of it, resulting in more dogmatic presentation than is desirable in a text-book for advanced students. Many of the statements need modification or qualification; some are even misleading. The omission, among the suggestions for further reading, of references to selected original papers will diminish the value of the bibliography which is concerned almost exclusively with other books or reviews.

1937 Year Book of Dermatology and Syphilology

Edited by FRED WISE, M.D., Professor of Clinical Dermatology, New York Post-Graduate Medical School; and MARION B. SULZBERGER, M.D., Assistant Professor of Clinical Dermatology at the School. Chicago: The Year Book Publishers; London: H. K. Lewis and Co. 1938. Pp. 736. 12*s.* 6*d.*

THIS year book continues to be a mirror of the scientific progress made during the year. It enables the conscientious physician practising the specialties covered to keep abreast of modern advances without more effort than is involved in reading a single volume. Among the more important papers epitomised are those dealing with the occupational dermatoses, neuropathic eczema, viruses in the ætiology of skin diseases, dietetic treatment of neurodermatitis, treatment of kraurosis vulvæ, reciprocal relations between the liver and skin, the pathochemistry of seborrhœa, and differences of radiosensitivity of skin glands. Following their custom the editors have expressed in footnotes their own views, sometimes critical and always stimulating, on many of the contributions selected for notice. They have themselves contributed, as in former years, an article on treatment as a "guide for the general practitioner." This one, on the treatment of common fungous affections, should not be neglected even by the experienced dermatologist. There is no more useful publication in the whole realm of dermatological literature, and we trust that its issue will continue to be under the able guidance of its present editors for many years to come.

Pre-Natal and Post-Natal Management

By J. ST. GEORGE WILSON, M.C., M.B., Ch.M., F.R.C.S., F.C.O.G., Hon. Obstetric and Gynæcological Surgeon, Royal Infirmary, Liverpool; Consulting Obstetrician, Walton Hospital, Liverpool; Lecturer in Clinical Obstetrics and Gynæcology, University of Liverpool. London: Edward Arnold. 1937. Pp. 206. 10*s.* 6*d.*

A SMALL book always tends to find favour with practitioners and students who know from experience that one twice the size does not necessarily contain double the information, although it may give much more detail. There is some evidence of undue compression here (post-natal management occupies fifteen pages and toxæmias of pregnancy only twelve), but the doctor unable to find much time for professional reading will certainly derive benefit from Mr. Wilson's wise advice. He draws special attention in his preface to the tendency to neglect the general systemic condition of the patient from an undue regard for the state of her pelvis. The attempt, however, to include in this little book some account of general medical diagnosis and treatment is not very successful; the management of acute and sub-acute phthisis in the pregnant woman cannot be effectively summarised in 26 lines.

On one or two points the author differs from the main body of current opinion. He advises against abdominal evacuation of a hydatidiform mole under any circumstances, recommends unconditionally chloroform to control eclamptic convulsions, and goes too far, in our view, in saying that "according to the modern theory of water intoxication, the retention of water in the tissues either as a result of, or in any case in association with, pregnancy negatives the unlimited ingestion of water." His advocacy of parathyroid extract with calcium not only in cases of peripheral neuritis but also in chorea, asthma, and for the attacks of faintness and giddiness which commonly occur is hardly in accord with modern practice.

The drawings and photographs which illustrate this book are excellent and on the whole the advice given is sound.

Diseases of Women

Sixth edition. By Ten Teachers. Edited by CLIFFORD WHITE, Sir COMYNS BERKELEY, and FRANK COOK. London: Edward Arnold. 1938. Pp. 492. 18*s.*

"Ten Teachers" will continue to be popular, for the combined authorship and editorial committee go far to overcome one of the student's great difficulties—the diversity of opinion among professors and lecturers. Here is to be found information which at least ten senior specialists have agreed upon, and the student can feel that he treads on firm ground. In this edition the section on the physiology of menstruation has been brought up to date, with a short but clear account of our knowledge of pituitary and ovarian hormones; this includes a statement on the units in use, and the trade names of some of the better known preparations. A brief chapter has been added on the methods of contraception and sterilisation, an aspect of the subject which has increasing importance in actual practice. The chapter on neurasthenia and neurosis in relation to pelvic disorders strikes us afresh as a most valuable feature of a work which gives a comprehensive account of the diseases of women, well set out and adequately illustrated.

Applied Mycology and Bacteriology

By L. D. GALLOWAY, M.A. Cantab., Imperial Mycologist, New Delhi, 1934–1937; Mycologist to British Cotton Industry Research Association, 1927–1934; and R. BURGESS, M.Sc., Ph.D. Lond., Dairy Bacteriologist to Lancs County Council; Microbiologist to British Woollen Industry Research Association, 1927–1935. London: Leonard Hill. 1937. Pp. 186. 10*s.*

WITHIN its scope this is an excellent and interesting little book and one very suitable as an introduction to microbiology for anyone with a sound scientific training. Though brief and clear, it is not in any sense a "popular" work. The chapters are composed in an accurate and scholarly way, and the list of references at the end of each chapter is well chosen. Any young bacteriologist will find it worth reading; it will give him a broader outlook on his subject, emphasising just those parts of which he learns little or nothing from his medical books. Even mature

bacteriologists would, we think, enjoy the informative chapters on the textile and fermentation industries. Should a further edition be called for, we suggest that the chapter on hygiene and medicine be omitted. It is quite impossible even to sketch so vast a subject in so small a space. The chapter on agricultural applications might be extended with advantage, and a fuller account of soil fertility in relation to microbiology would be welcome.

Bec-de-lièvre

Formes-Cliniques-Chirurgie. By VICTOR VEAU, avec la collaboration de JACQUES RÉCAMIER. Paris: Masson et Cie. 1938. Pp. 326. Frs.100.

THIS book on hare-lip represents the experience of a surgeon who has operated on over 1200 patients. He has examined all the many aspects of the problem in a logical sequence and set out his conclusions with precision. He first describes and classifies the various types of hare-lip and then reviews the older methods of treatment before giving an account of the experimental work which led to the elaboration of the operation he now performs. Each of the four types of hare-lip is discussed separately and four operations are minutely detailed. Operations on the lip, unlike those on the palate, are judged by two standards, the functional result and the cosmetic appearance. It is of the latter, the appraisal of which is a personal factor, that Veau says ruefully: "Mais qui est satisfait de la forme de son visage?"

The book is illustrated with such profusion that it would be quite intelligible to a reader who knows no French; the various operations described are shown stitch by stitch and step by step. There is likely to be as wide a demand for this work as for its companion-volume on cleft palate.

Sir Kenelm Digby

By JOHN F. FULTON, M.D. New York: Peter and Katharine Oliver. 1937. Pp. 75.

THIS brochure is a reprint with some additions of a paper read to the Grolier Club in New York early last year. It is adorned with some excellent photographs of the pictures of Digby and his wife Venetia, and of some of the outstanding examples of the books which he once possessed. Within the limits of such a paper it is admirably done and fills us with a lively regret that we should not have enjoyed the exhibition of books, pictures, and manuscripts which accompanied its delivery at the Grolier Club. Digby was a very remarkable character: a courtier, a scholar, a bibliophile, a fighter with a record which recalls the exploits of Drake and his fellows (and like them dubbed a pirate), and, as Dr. Fulton well remarks, a letter-writer of great merit. There are a number of conundrums in his life; not the least of which is that though he was known to be a devoted and intimate adherent of Queen Henrietta he was yet allowed to reside in England in the year 1654 and within a few months was on terms of close friendship with Cromwell. However, the known facts of his life are sufficiently remarkable to make him one of the outstanding figures of the seventeenth century. He was one of the earliest and one of the most magnificent contributors to the treasures of the Bodleian; he was one of the circle which founded and gave impetus to the Royal Society; he was an intimate friend of Ben Jonson and Selden and Boyle; and for medical men he is memorable as an early and resolute supporter of Harvey. He was as much at home in Paris as in London, and knew and revered Descartes to whose notice he brought Harvey's work. Dr. Fulton's interest however is on this occasion not so much in the man as in his books. He gives us a full account of Digby's various writings and especially of the famous "powder of sympathy"; and then passes in review the volumes which have come down to us which once belonged to Digby. Of those which he gave to Harvard in 1655 all were burned, save one, in a disastrous fire in 1764. But to judge from Dr. Fulton's lists there is no lack of superb examples in the United States.

It must be added with regret that the production of this brochure hardly does credit to a bibliophile's accuracy. The form and the illustrations are as we have said excellent, the type and the paper are good, but there are some deplorable misprints.

The Post-Mortem Examination

By SIDNEY FARBER, M.D., Associate in Pathology, Harvard Medical School. London: Baillière, Tindall and Cox. 1937. Pp. 201. 16*s*.

THOUGH this book has been most carefully compiled and is properly insistent upon attention to detail and the maintenance of good records, it remains unimpressive, and the illustrations do little to enhance its appeal. Many procedures are dealt with in a manner which suggests inexperience of their results. For instance, the advice is given to remove the pituitary by blunt dissection, to handle organs for purposes of traction by toothed forceps or clamps, to remove femoral bone-marrow by the use of hammer and chisel. These are primitive methods which lack delicacy. Nor do we feel that the omission of technical refinements is sufficiently compensated by the introduction into the text of supplementary articles dealing with anomalies of development unlikely to affect the technique described, or with disease processes.

La radiokymographie du cœur et des vaisseaux

By EMILE BORDET and H. FISCHGOLD. Paris: Masson et Cie. 1937. Pp. 134. Frs.30.

THIS short book is a valuable account of a development of radiology which is attracting increasing attention on the Continent. The first chapter deals with the principles of X ray kymography and the various modifications in technique made by different workers, due credit being given to the pioneer work of Stumpf, whose two books on the subject were recently reviewed in our columns. Then follows an account of the appearance presented by the heart and great vessels in normal and in typical pathological conditions; unfortunately the deductions drawn from the kymograms are not always easy to follow owing to discrepancies between the text and the lettering of the figures. The authors, it is interesting to observe, accept the view that movement of the aorta is due to displacement rather than to dilatation. It is the latter part of the book that makes the best reading for here the authors describe the results of their own investigations in the light of fundamental physiological principles. They show how the post-systolic residue of blood in the ventricles varies in different physiological and pathological conditions and how in valvular lesions adequate compensation depends upon the capacity to obey Starling's law of the heart. This section should be read by physiologists as well as by radiologists and physicians. Sketchy though it is, the book is highly suggestive of a direction in which clinical progress may be looked for.

THE LANCET

LONDON: SATURDAY, MARCH 12, 1938

THE PHYSICAL STATE OF INTERCELLULAR SUBSTANCE

In descriptions of intercellular ground substance incidental to discussions of physiological and pathological processes, references are often made to "tissue and lymph spaces" and to "intercellular fluid or lymph." Since it was established that lymphatics form a closed system of channels, there has been no justification for the use of the term lymph space unless we can show that outside the system there are other preformed spaces into which lymph can pass. The only basis for the supposition that such spaces exist lies in the observation of clefts in the stainable ground substance seen in paraffin sections of tissues, which may be due to shrinkage from dehydration, and in the description by the CLARKS [1] of perivascular spaces which surround young growing blood-vessels observed in living regenerating tissue. Some but not all of the spaces are due to developmental shrinkage as the vessels straighten out and become narrower. All the evidence goes to show that under normal conditions the idea of intercellular fluid is also a false conception. The space between cells, vessels, nerves, and fibres is occupied by a gelatinous substance. The most convincing proof of this comes from direct observation of living connective tissues by means of the delicate and skilful technique of SANDISON [2] and of the CLARKS.[3] The gelatinous state of the intercellular substance is perhaps one of the most important of many extremely interesting facts that have been established or confirmed by means of this method, which consists in watching the actual growth of new tissue in the ears of rabbits and dogs between a transparent base and a coverslip so thin that all powers of the microscope can be used. According to these authors the intercellular substance is gelatinous until inflammation or œdema occur, when it appears to become fluid. Inflammation can be produced at will and subsequent changes in intercellular substance followed by watching the movement of red blood corpuscles or other small particles which bob about in the fluid state and remain at rest in the gel. In attempting to discover the physical and chemical nature of intercellular matrix BENSLEY [4] made bullæ, in subcutaneous connective tissue, of suspensions of living paramecia in salt solutions to which they had become accustomed. The bullæ were then excised and the preparation covered whole with a coverslip supported on bits of glass. The paramecia were watched and seen to react in a peculiar way. They were very active, swam vigorously back and forth, and suddenly rebounded without coming into contact with any visible structure. Eventually all died in the places in which they were observed. None escaped into tissue surrounding the bullæ. If the subcutaneous tissue consisted only of fibres some of the paramecia would have escaped but they were evidently confined by invisible walls of viscid intercellular substance.

A new observation in support of the view that intercellular substance is a gel comes from MACMASTER and PARSONS,[5] who watched the dyes pontamine sky blue and patent blue V diffusing out of lymphatics into which they had been injected in the living mouse's ear. By means of the Ultropak microscope it could be seen that the dyes do not pass out in a diffuse cloud but appear at first as fine, irregular, bristling or wavy lines of colour extending from the wall of the vessels. By means of a micro-probe these lines can be bent and twisted, and when pressure is removed they spring back to their original positions. The authors say that the dye appears to be fixed either between or upon preformed tissue elements. Within a few minutes the wavy lines grow wider and their margins less sharp, but on manipulation the dye still seems to be fixed. The next change is the onset of mild œdema due to the presence of the dye, and with it the colour becomes diffuse throughout the tissue. Dye can be pressed out of one portion of tissue into another with the œdema fluid, and is no longer confined to wavy elements which are probably connective tissue fibrils. The authors regard these findings as suggesting strongly that dyes extend along the interface between the surfaces of contiguous connective tissue fibres or along that between fibres and an interstitial gel. According to WOLBACH,[6] the nutrition and gelatinous state of interstitial substance is dependent in some way upon adequate supplies of vitamin C.

Thus it seems that our cells repose in a jelly, not upon a water bed. Interest in the properties of this intercellular substance is more than academic. In virtue of its physical nature alone it is probably the first barrier in the defence mechanism against bacterial aggression. Micro-organisms cannot be distributed beyond their point of entry, until the substance has been changed from solid to fluid state, and it may also impede the rate of diffusion of soluble toxic substances.

RICKETS AND *VITAMIN STOSS* THERAPY

PEOPLE speak of rickets as a vanishing disease, and happily they are not far wrong as regards Great Britain and the medically more progressive continental countries. Florid rickets with gross deformities is much less common than it was. Yet if the situation has improved it is only because of a continuous offensive, and unless positive anti-rachitic measures are maintained as an unflagging

[1] Clark, E. R., and Clark, E. L., *Amer. J. Anat.* 1936–37, **60**, 253.
[2] Sandison, J. C., *Ibid*, 1928, **41**, 447 and 475.
[3] Clark, E. R., and Clark, E. L., *Ibid*, 1933, **52**, 273.
[4] Bensley, S. H., *Anat. Rec.* 1934, **60**, 93.
[5] MacMaster, P. D., and Parsons, R. J., *Proc. Soc. exp. Biol., N.Y.* 1938, **37**, 707.
[6] Wolbach, S. B., *Science*, 1937, **86**, 569.

routine the disease is one that will flourish. Dr. JOHANNE CHRISTIANSEN in Denmark heads an article [1] "Rickets has disappeared!" and proceeds to demolish the assertion. Prof. ROMINGER of Kiel speaks of an increase of rickets,[2] and quotes authorities recording the percentage of rachitic infants as 37–46 in Westphalia, 55 in Dortmund, 40 in Vienna and Paris, and 50 (in the summer) or 75 (in the winter) in Basle. These figures indicate a very high incidence but it is unlikely that they represent a recent increase; the probability is that observation has become much more complete and critical. When one considers, however, the completeness of our knowledge of how to prevent and cure this disease, the state of affairs described seems very deplorable.

A new piece of heavy artillery has recently been introduced into the campaign. It seems first to have been used by HARNAPP,[3] but has won greater fame under the command of BRAULKE [4] of Marburg, who gave it the name of *Vitamin Stoss* therapy. It consists in oral administration of vitamin D in one enormous dose of about 15 mg.—that is to say, 600,000 international units, an ordinary daily dose being 3000 I.U. or less. Within a very few days healing can be detected in radiograms, and this proceeds to completion without further treatment. In 50 cases BRAULKE saw no ill effect, and his observation is confirmed by BISCHOFF [5] of Greifswald who has treated 10 children in the same way. The use of the *Vitamin Stoss* is particularly recommended in cases of spasmophilia and tetany, in severe rickets with risk of fracture, and in rickets associated with infection, acute or chronic; it has had signal success in children desperately ill with pneumonia or whooping-cough complicated by rickets. Wherever a rapid result is important *Vitamin Stoss* therapy is considered appropriate. The suggestion is also made that it might be employed to advantage in out-patient and welfare departments where the doctor cannot rely on the child's parents or guardians to carry out regular treatment conscientiously—an all too common state of affairs. Obviously the method is not one to apply lightly, but it is not unpromising, and should not be rejected out of hand.

A resemblance is evident between *Vitamin Stoss* therapy and the injection of large doses of vitamins A and D, as described by Dr. NORMAN LEAK on p. 599 of our present issue. Dr. LEAK has used such injections in the acute states of a variety of diseases and is deeply impressed by their value, though the circumstances of general practice have necessarily prevented him from securing the scientific controls needed to carry full conviction. He attributes the favourable reactions he has observed chiefly to the vitamin A which predominates in his preparation, but one is left wondering whether such large doses of vitamin D given at the same time might not be significant.

[1] Christiansen, J., *Ugeskr. Læger*, 1937, **99**, 683; *Lancet*, Feb. 5th, 1938, p. 336.
[2] Rominger, E., *Med. Klin.* 1938, **34**, 1.
[3] Harnapp, G. O., *Klin. Wschr.* 1936, **15**, 1043; *Mschr. Kinderheilk.* 1936, **66**, 318.
[4] Braulke, H., *Z. Kinderheilk.* 1937, **59**, 18.
[5] Bischoff, H., *Jb. Kinderheilk.* 1937, **150**, 2.

THE ANTIGENS OF THE TYPHOID BACILLUS

STUDIES that have been carried out during the past few years on various Gram-negative bacilli, and particularly on bacteria of the typhoid-paratyphoid and dysentery groups, mark an important advance in our knowledge of the chemical substances that determine the antigenicity and toxicity of these bacterial species. The studies of AVERY and HEIDELBERGER, and of many subsequent workers, had already demonstrated that the antigenic specificity of the various types of pneumococci depended on the presence in the bacterial capsules of a series of chemically different polysaccharides, and it was known that specific polysaccharides could also be isolated from other capsulated or non-capsulated bacteria. These polysaccharides had, however, the properties of haptens, rather than of complete antigens. They gave specific precipitation in the test-tube, when mixed with the corresponding antisera produced by inoculating animals with the intact bacterial cells; but they failed to induce antibody formation themselves, when injected in the purified state. They were almost or entirely non-toxic.

In 1933 BOIVIN and MESROBEANU reported the isolation from *Bact. typhi-murium*, by extraction with trichloracetic acid, of a complex antigenic component consisting of a polysaccharide linked to a phosphatide or nucleotide; and in 1934 RAISTRICK and TOPLEY independently reported the isolation from the same organism of a similar antigenic component by the tryptic digestion of acetone-extracted bacterial cells. In both cases the crude extracts were further purified by alcohol precipitation. The interest of these new substances lay in the fact that they not only reacted specifically in the test-tube, but induced active immunity when injected into mice, and stimulated the production of specific antibodies in vivo. They were also found to be highly toxic, and it was shown by DELAFIELD that they induced characteristic changes in the blood-sugar concentration when injected into rabbits. Further studies by these two groups of workers have shown that antigenic components of this kind can be isolated from a variety of Gram-negative bacilli, but not from Gram-positive organisms. It has become clear that they represent the O (somatic) antigens of the bacterial cells, and, at the same time, constitute the principle "endotoxin." In the particular case of *Bact. dysent.* Shiga BOIVIN and MESROBEANU have been able, by their technique, to differentiate the exotoxin produced by that organism from the somatic endotoxin.

W. T. J. MORGAN has recently shown that this somatic antigen can be isolated from *Bact. dysent.* Shiga by a third method, extraction with diethyleneglycol; and in a still more recent paper HENDERSON and MORGAN [1] have applied the same technique to various strains of the typhoid bacillus. This organism is of particular interest because of the demonstration by FELIX and PITT of the Vi antigen and antibody, and their importance in active or passive immunisation. It has already been shown

[1] Henderson, D. W., and Morgan, W. T. J., *Brit. J. exp. Path.* 1938, **19**, 82.

by TOPLEY and RAISTRICK that the antigenic components isolated by tryptic digestion from Vi (O+Vi) and non-Vi (O) strains of *Bact. typhosum* show the same differences in immunological behaviour as the corresponding bacterial cells; so that it would appear that the Vi antigen belongs to the same chemical category as the O antigen, at least in regard to its resistance to tryptic digestion and its behaviour to alcohol precipitation, though the two antigens show minor differences in their reaction to certain other precipitants. HENDERSON and MORGAN have obtained similar results with the components isolated by extraction with diethyleneglycol. They were, however, able to include in their studies two rough strains of *Bact. typhosum*, isolated by FELIX and his colleagues, which contained the Vi antigen but were entirely, or almost entirely, free from the O antigen. They conclude from their findings, and particularly from the results of cross-precipitation tests, that the Vi antigen is not a modified O antigen, but a separate chemical entity. Their paper includes a series of interesting observations on certain differences between the antisera produced by immunisation with the isolated Vi antigen, or with the intact bacterial cells. Although both reagents induce the formation of Vi agglutinins to high titre, the protective value of the antisera produced by the partially purified antigen was found to be less, as judged by the minimal protective dose, than that of antisera produced in response to the intact bacterial cells.

BRONCHIECTASIS AND PULMONARY COLLAPSE

MOST of the speakers at a discussion reported on another page seem to have found convincing clinical and bronchoscopic evidence that post-operative massive collapse of the lung is mostly due to obstruction by a plug of tenacious secretion. Dr. MAXWELL pointed out justly that the chief danger of this condition rests in the liability of the patient to develop lung abscess or bronchiectasis and that the speedy re-expansion of the lobe affected should thus be the first aim in treatment. LEE LANDER and DAVIDSON have recently approached the subject of pulmonary collapse from the other side and believe its association with early bronchiectasis to be much more significant than is generally recognised. The classical text-book description of bronchiectasis was based on autopsy findings after years of an increasingly foul infection had led to premature death. The introduction of lipiodol has led to a recognition of a very different picture since bronchial dilatation can be detected at a stage when physical signs are absent and symptoms minimal. The old view of fibrotic contraction following infection as the factor responsible for the dilatation is no longer tenable, and the pathology of bronchiectasis is being studied afresh. The same observers have recently set forth their grounds for believing that pulmonary collapse is the invariable antecedent of bronchiectasis, the atelectasis being due to the aspiration and retention of viscid sputum.[1] They maintain, moreover, that in the absence of infection bronchiectasis is reversible; the bronchi are capable of resuming their original shape and size if the lung becomes reinflated, and when this occurs the disease is regarded as benign. LEE LANDER and DAVIDSON base their conclusions partly upon lipiodol investigation of medical and surgical cases in which a massive atelectasis has been diagnosed on clinical grounds, and partly on the experimental production of bronchial obstruction in cats, opaque oil being instilled into the trachea before and after the atelectasis is produced. Further evidence against infection as the cause of the dilatation is provided by the examination of lobes removed for bronchiectasis at the Brompton Hospital. These showed no adhesions between the affected lobe and the chest wall or between two bronchiectatic lobes, and histologically many of the affected bronchi were seen to have an intact epithelial lining.

Of particular interest is what LEE LANDER and DAVIDSON have styled the "black lobe." Those with experience in pneumothorax work are familiar with the sudden change in appearance sometimes observed in the diseased upper lobe, when it seems to diminish in volume and to assume a homogeneous density greater than that of the surrounding lung. This phenomenon commonly manifests itself after the apex of the lung has been completely freed by the division of adhesions and has been hailed by the operator as a perfect result. The authors believe this "black lobe" to indicate massive lobar atelectasis and with the aid of lipiodol they have demonstrated bronchial dilatation within it. Their theory is attractive and seems to fit the facts. The crux of the problem is the mechanism whereby atelectasis, once it has occurred, is compensated. The first effect of a massive collapse is an increase in the intrapleural negative pressure, which, if it becomes pronounced, leads to contraction of the spaces between the ribs, a shift of the mediastinum, a rise of the diaphragm, and compensatory emphysema of the lung. If the negative pressure is still not relieved the bronchi dilate. A concrete example is furnished by the catastrophe that sometimes follows an extensive apical thoracoplasty. After the operation coughing is painful and the sputum collects and blocks the bronchus to the lower lobe, causing a massive collapse. Often compensation cannot be achieved by the falling in of the thoracic wall because the mobility of the mediastinum and diaphragm is limited by adhesions due to the disease and the remainder of the lung has been put out of action by the surgeon. It is left, therefore, to the bronchi to relieve the excessive negative pressure; this they do by dilating and, if the lower lobe is not reinflated and if infection occurs, the classical picture of fœtid bronchiectasis soon becomes established. The mechanics of the development of the "black lobe" are different. Here the presence of a pneumothorax is a safe-

[1] Lander, F. P. Lee, and Davidson, Maurice, *Brit. J. Radiol.* February, 1937, p. 65.

guard and the atelectasis can be compensated by giving a refill of air. LEE LANDER and DAVIDSON have shown how a refill in such circumstances can convert a collection of dilated bronchi into tubes of normal dimensions. As we have noted above, the authors regard a reversible bronchiectasis of this type as a "benign" form of the disease; it is, in our view, perilously close to the real thing and if at this stage infection supervenes an irrevocable clinical bronchiectasis becomes established. Fortunately in the consumptive with a pneumothorax this is a rare event.

It is pertinent to inquire into the future of the "black lobe." If the tuberculosis within it heals and it reinflates all will be well. If, however, it is the seat of massive disease it will probably never re-expand and at the end of the pneumothorax treatment either the rest of the lung will have to fill the gap by becoming emphysematous, or the pneumothorax will have to be kept up indefinitely. Relevant to this problem is the technique recently devised by BROOKS[2] for mechanically obstructing the lower lobe bronchus through the bronchoscope. By this means it is possible to induce, with safety, a massive collapse of the lobe in the presence of a pneumothorax as an auxiliary method in the treatment of basal phthisis. The manœuvre is said to be followed by considerable improvement in the local lesion, evidenced by a rapid closure of the cavity. Whether this procedure does more than snatch the patient from the frying pan of phthisis and drop him in the fire of an even more unpleasant disease is not yet certain.

ANNOTATIONS

THE CARE OF THE ELDERLY INSANE

THE recent clamour over what is regarded as too ready certification of elderly persons in the public assistance institutions of West Wales reflects an anxiety which is easy to understand. The elderly men and women who show conduct disorder generally belong to one of three types: (*a*) those who have been insane for years, such as chronic schizophrenics; (*b*) those who show disorders of behaviour due to physical causes such as cardiovascular and renal disease, or more commonly cerebral atheroma, hypertension, or degenerative processes; (*c*) those manifesting the mild character changes of senility, with occasional outbreaks. From the point of view of the family the distinction between types (*a*) and (*b*) is not negligible. The former should be included in any genetic survey of mental disorder; whether the condition of the latter has genetic import, depends, among other factors, on the form of the physical disorder, and the degree to which this has precipitated mental symptoms. In any case the relatives of a person belonging to type (*a*) should regard the defect in their stock more seriously than those of type (*b*), in whom the stigma of mental disorder may not be warranted at all and in any case is of a very different order. The lack of understanding of these differences is unfortunate in so far as it sometimes leads to the withholding of information.

The senile dement (type (*c*)) can generally be managed in his own home or in a municipal hospital. The other types include men and women whose conduct is so abnormal that it cannot be dealt with outside a mental hospital, and those whose lapses of behaviour are rather negative than positive in character. Patients of long standing in mental hospitals ultimately reach this vegetative stage and remain in it for many years. All hope of cure has been abandoned, and the possibility of their being suitably cared for elsewhere has often not been considered. The overcrowding of the mental hospitals has recently, however, led to suggestions from the Board of Control that many chronic harmless psychotics might be transferred from these hospitals to the infirm wards of a municipal hospital. These proposals have aroused almost as much criticism as those for transfer in the other direction. More coöperation between the authorities of the different types of institution is certainly needed and possibly the colony system might be adopted with advantage. In several continental countries the community cares for psychotics of certain types as well as for defectives in big colonies within the limits of an ordinary village, for example at Gheel in Belgium and Dun-sur-Auron in France. Those patients not requiring custodial care are accommodated in families, where they take their share of such work as is suitable to their mental and physical state. The success of less ambitious schemes has recently been reported from Poland.[3] There some of the insane are placed in houses within a mile or two of the mental hospital, often those belonging to hospital employees. In one centre a colony system was started 80 years ago at a distance of forty miles from the main hospital, and 200 patients were housed there under adequate medical and nursing supervision. Nearer home, the fact that boarding-out of defectives in Scotland has been so satisfactory suggests that in England we are too hide-bound by our conception of custodial care and that an extension of the boarding-out system to psychotics may solve more than the economic problem. The enthusiasm over occupational therapy may be a blind that shuts out further consideration of the occupation and social care of the elderly and quiescent insane.

THE PIRQUET CONTROL OF NURSES IN HOSPITAL

THE Assistance Publique, which is responsible for the administration of the public hospital services in Paris, appointed Dr. E. Rist as long ago as 1923 to examine and report on those members of the hospital personnel who might develop tuberculosis. In 1935 this system was amplified, and Dr. Rist was invited to supervise the medical examinations for possible tuberculosis of all the nurses entering the Salpêtrière school of nursing, which is the main source of supply of nurses for the Paris hospitals. The examinations included radiography of the chest and Pirquet testing as routine measures supplemented, if need be, by a clinical examination and inquiries into the nurses' antecedents. On Jan. 11th Dr. Rist and his colleagues, Dr. P. Reyt and Dr. J. Tuchila, in a communication to the Academy of Medicine, traced the Pirquet careers of the 165 women who began their nursing activities in October, 1935. They were classified according as they belonged to section A (nursing proper), or section B (administra-

[2] Brooks, W. D. W., *Brit. J. Tubere.* January, 1938, p. 14.
[3] Report to the International Health Office, see *Bull. Off. int. Hyg. publ.* December, 1937, p. 2564.

tive services such as kitchen and linen cupboard). Section A comprised 144 probationers who were of course much more likely to be exposed to infection than the 21 women working in a comparatively tubercle-free atmosphere. The nurses found to be Pirquet-negative in October, 1935, were tested again in June, 1936, January, 1937, and October, 1937, and, as was to be expected, the proportion of conversions to the Pirquet-positive state was much higher in section A than in section B. In the autumn of 1935 the ratio of Pirquet-positive to Pirquet-negative nurses was 97 to 68; two years later, 46 of the 68 negative reactors had become positive reactors at the cost of 8 cases of tuberculosis, 2 of which terminated fatally. In contrast to this high tuberculosis rate was the complete absence of signs of tuberculosis among any of the 97 probationers who were already Pirquet-positive when they began their nursing studies. These observations confirm the findings of J. Heimbeck at the Ullevaal Hospital in Oslo. If the tuberculosis prognosis for the originally Pirquet-negative probationer is a shade less black in Paris than in Oslo, the difference may be due to the fact that at Ullevaal probationer nurses plunge forthwith into work in tuberculosis services, whereas the Salpêtrière nurses are allocated to such services only towards the end of their training.

CONGENITAL HYPOTONIA

AT the beginning of this century when pædiatrics was beginning to be established as a specialty, interest in disorders of infancy and early childhood led to the recognition of many typical syndromes and to their association with the names of those who had described them. Later clinical and pathological observations modified many of the distinctions on which these groupings were based, though a few types still remain firmly established in their original form. The pathogenesis of muscular flaccidity in early infancy is perhaps the question on which opinion has undergone the most change, and it is still not clearly understood. The term myatonia or amyotonia congenita was applied by H. Oppenheim to the type of infant exhibiting generalised muscular flaccidity at or soon after birth, the condition being looked upon as primarily myogenic. In 1913 F. E. Batten, classifying myopathies, referred to a "simple atrophic type" characterised by smallness, loss of power, and loss of tone of *all* the muscles of the body without localised atrophy, and he included Oppenheim's disease in this category. But the view that myatonia was dependent on disease of the lower motor neurone was already gaining ground, and in the same year Oppenheim ascribed the pathological process to delayed development of the musculature *or* of the anterior horn cells. A few years later it had become established beyond doubt that this disorder was not one of muscles, and thereafter no reference appeared in text-books of the subject to any *congenital* myopathy. The only type of myopathy recognised in early infancy is the Landouzy-Dejerine type which is not associated with generalised hypotonia.

The possible occurrence of congenital myopathy is suggested, though this point is not emphasised, in a study of congenital paralysis and hypotonia by Prof. Cornelia de Lange of Amsterdam.[1] She gives a clinical and pathological account of an infant with amyotonia which died on the twentieth day, probably the earliest age at which a histological examination has ever been undertaken. The author's belief in the identity of Oppenheim's and Werdnig-Hoffmann's diseases is forcefully expressed. Her arguments carry conviction, though they add little to the review of the subject by Greenfield and Stern in 1927. She goes somewhat further, however, in suggesting that amyotonia is to be regarded as an abiotrophy in the sense of Gowers. When he introduced this conception Gowers did not apply it to any disorder which was manifest at the time of birth, but it may legitimately be extended to include a prenatal failure of vitality. Prof. de Lange proceeds to consider the differential diagnosis of hypotonic infants in some detail. She agrees with the decision of Greenfield and Stern in their critical survey of cases published as amyotonia to reject those (three) in which the nervous system showed no histological abnormality, and submits that these were cases of "Erb's disease, dystrophia musculorum progressiva"; it will be remembered that this term was applied by Erb to myopathies in general, to emphasise his view that they formed a single nosological entity. Prof. de Lange emphasises the existence of a congenital or early infantile type of this disease, and gives details of some members of an affected family, one of whom came to post-mortem examination. An important point in the clinical diagnosis of these cases from amyotonia is the participation of the diaphragm in the paresis. There would appear to be a close correspondence between the type of case here described and the simple atrophic type of myopathy referred to by Batten, and it may be that the occurrence of myopathies in the first few weeks of life deserves more explicit recognition than it has received of late.

[1] *Acta pædiatr., Stockh.* 1937, **20**, Sup. III.

PREPARATION OF TYPHUS VACCINE

THE preparation of vaccines made from ordinary bacteria presents little or no difficulty; but that of vaccines from rickettsiæ or filtrable viruses is far from simple. Hitherto it has been common to infect a suitable animal and to use its tissues, either untreated or after exposure to formol or some other inactivating agent, as the actual vaccine. The difficulties and dangers of this procedure are well known, and attempts have been made in recent years to supplant the use of living animals by tissue cultures of the virus. Already successful results have been reported with vaccinia virus. It now seems probable that similar success may be achieved with the virus of typhus—*Rickettsia prowazeki*. In two communications Zinsser, Wei, and Fitzpatrick[1] describe the growth of both murine and classical strains of this organism on Maitland cultures put up in sloped agar tubes. A 4 per cent. agar solution in water is mixed with an equal volume of double strength Tyrode's solution to which 50 per cent. horse-serum has been added before filtration. The initial reaction, which is controlled by phenol-red in the tubes, should be about *p*H 7·4–7·6. The agar is sloped in a test-tube in the ordinary way. Guinea-pig tunica is minced very finely, and is heavily inoculated by dropping the centrifugalised concentrate of a Maitland culture on to the tissue in a Petri dish. After 5 or 10 minutes at room temperature this tissue is then "buttered" on to the surface of the agar, and the tubes are closed with a rubber stopper through which passes a glass tube drawn to a capillary at the upper end. The purpose of the tube is to control the reaction of the medium. As the tissue metabolises CO_2 is given off; if it is allowed to accumulate, the reaction becomes too acid. By breaking the capillary, the

[1] Zinsser, H., Wei, H., and Fitzpatrick, F., *C.R. Soc. Biol. Paris*, 1938, **127**, 229; and *Proc. Soc. exp. Biol., N.Y.* 1937, **37**, 604.

gas can escape and the reaction remains alkaline. After incubation for six days some multiplication is already apparent; after ten days smears from the tissue on the surface of the agar show a growth of rickettsiæ. The amount of growth obtainable is surprising, and it is believed that each tube will suffice for two or three doses of vaccine. When it is remembered that Weigl's vaccine, which is prepared by the cultivation of rickettsiæ in the louse's intestine, requires about 150 lice for the vaccination of each individual, it will be realised that the method now described by Zinsser and his colleagues may afford a great saving in both time and labour. The method clearly needs elaborating, but if the results already obtained are confirmed it should prove of value both in academic and in practical work, and it is even possible that it may be applicable to the cultivation of filtrable viruses.

CYSTIC ENDOMETRIAL HYPERPLASIA

CYSTIC endometrial hyperplasia, according to present beliefs, is due to the persistence of cystic ovarian follicles and to the continued action of œstrogenic hormone. This view is based both on pathological studies and on a number of experimental investigations. It is also possible, as was first speculatively suggested by Witherspoon, that fibromyomata of the uterus are due to excessive œstrogenic stimulation. Nelson's [1] experimental observations on guinea-pigs support this conclusion, while Murray Blair [2] states that 81 per cent. of the uteri removed in 1934 at the Vancouver General Hospital because of fibromyomata showed cystic hyperplastic changes. Such a high proportion cannot reasonably be regarded as a pure coincidence. In a recent paper Randall and Herrell [3] report that progestational differentiation, presumably caused by luteal stimulation, can often be observed in an endometrium which also shows cystic changes. Their interpretation of this fact is that the occurrence of the luteal response is secondary to the œstrogenic stimulation. Confirmatory observations are provided by Murray Blair,[2] who reports that luteal cysts may be found in the ovaries of women with endometrial hyperplasia. Campbell and his colleagues,[4] on the other hand, believe that the corpus luteum functions according to an "all or nothing" law, and they mistrust diagnoses of endometrial hyperplasia in cases where progestational changes can be detected. This view has long been maintained by Burch, and it receives further support in a recent statement by Mason and others [5] who affirm that signs of current corpus luteum activity are absent in cases of "Swiss cheese" endometrium. A priori, however, it seems unlikely that the corpus luteum functions in an "all or nothing" manner. There is, moreover, ample experimental evidence that the extent of the changes which luteal hormone will cause in the endometrium at any given time will depend on the degree of œstrogenic stimulation. Until recently, the treatment of cystic endometrial hyperplasia usually involved the patient in the dangers of a major abdominal operation, for hysterectomy was often the only method of preventing the profuse and troublesome uterine bleeding associated with the condition. The evidence now before us suggests that progesterone in doses sufficient to counteract the excess of œstrin may prove to be a rational and safe method of treatment. Alternatively the condition would seem to be one in which testosterone propionate, to the gynæcological uses of which we have recently referred, might be tried.

[1] Nelson, W. O., *Anat. Rec.* 1937, **68**, 99.
[2] Blair, E. M., *Canad. med. Ass. J.* 1936, p. 603.
[3] Randall, L. M., and Herrell, W. E., *Surg. Gynec. Obstet.* 1937, p. 666.
[4] Campbell, R. E., Lendrum, F. C., and Sevringhaus, E. L., *Ibid*, 1936, p. 724.
[5] Mason, L. W., Black, W. C., and Gustavson, R. G., *Amer. J. Obstet. Gynec.* 1938, **35**, 189.

HEALTH EXHIBIT AT GLASGOW

THE Ministry of Health, in collaboration with other authorities, is organising a "Fitter Britain Exhibit" at the Empire Exhibition which opens in Glasgow in May. Later the exhibit will be packed up and sent on tour through the country. There will be a main hall approached through a vestibule with mural paintings of the family doctor and his auxiliaries. In the centre of the hall a "mechanical man," 11 feet high, will demonstrate the actions of respiration, digestion, and the circulation of the blood, and there will be scale models of a central health clinic and a general hospital. Bays on one side of the hall will show, by means of sculpture, photographs, and dioramas the provisions made for the health of infants, school-children, and adults. On the other side the first bay will contain a working model of a family taking well-balanced meals and a cartoon film showing the effects on the body of the various food constituents. The next bay will deal with housing and show a slum dissolving into modern houses, and the third will illustrate the safeguards taken against infection at a model port. Finally beyond the main hall there will be a darker chamber illustrating the perils of diseases and insect pests and the progress made in dealing with them.

WHAT IS SADISM?

THE recent flogging of two men for robbery with violence calls forth varied views whose vehement expression often marks their emotional value. There may be a frank satisfaction that a brutal crime has been met by a brutal punishment; the deterrent effect may be stressed, whereupon the penologist breaks in with the question whether a possible deterrent effect is worth the risk of arousing a dangerous antisocial reaction; or there is absolute condemnation of the flogging and the publicity that has attended it, supported by accusations of "sadism" which may or may not be understood by people who use the word so freely. Such accusations, in the absence of understanding, can only confuse the issue and spoil what may be a good cause. The eponymous originator of the word was a marquis whose memoirs described his sexual gratification from the infliction of pain upon others, and such perversions are sufficiently common to justify its use; how common they may be is not to be determined, but every clinical psychologist is aware of their occurrence and of the unfortunate stimulation the tendency receives from specific incidents. Farther along the scale are cases in which there is an impulse to the infliction of pain but its sexual nature is not recognised by its perpetrator. It is likely that some cases of cruelty that come before our courts are of that nature.

We owe to psycho-analysis the extension of the concept of sadism beyond those examples in which it is a conscious manifestation. To some extent this is a matter of direct observation, when, for example, in the course of analysis a patient discovers the motivation of past behaviour; an adult may recall being attracted in earlier life towards some account of cruelty and may now recognise the true nature of the attraction, of which he was not conscious at the time. It becomes more speculative when the impulse to inflict pain or, what is much the same, to act aggressively in physical ways, is ascribed entirely to this

same sadism. The recognition of a widespread impulse to cruelty is being forced upon us to-day, and, whether the psycho-analytical generalisation is correct or not, the popular use of "sadism" and "sadistic" as catchwords to indicate opprobrium and condemnation is more likely to rouse opposition than to lead to a calm discussion of a serious matter.

EFFECT OF ADRENALINE ON NITRITE COLLAPSE

THE various vasoconstrictor drugs, of which adrenaline is one of the more powerful, have not proved very useful in the treatment of shock in its manifold forms. As is well known from therapeutic experience the nitrites may produce symptoms of collapse or shock, and the effects of sodium nitrite have been used by Wilkins, Weiss, and Haynes [1] to test the action of adrenaline. It was found that after administering 3 grains of sodium nitrite to healthy young men syncope occurred after a short interval, when they were tilted up to an angle of 75° to the horizontal. It was accompanied by decrease of venous tone and of blood flow in the hand, with a fall in arterial pressure and a rise in heart-rate. When 1 mg. adrenaline was injected after giving the nitrite, the symptoms appeared more quickly after tilting; as compared with the effects of nitrite alone the venous tone was little affected, the blood flow was further reduced, and the arterial pressure was usually much reduced, though it might remain relatively high. The results are interpreted as showing an arteriole-constrictor effect of nitrite in the upright position, which is intensified by adrenaline; the decrease in venous tone resulting from the nitrite is not overcome by adrenaline. These observations on vascular changes in the hand, if they can be assumed to apply also to the vital centres, would explain the symptoms. It is evident at any rate that adrenaline increases the collapse symptoms caused by nitrite, and although this particular condition is not likely to be encountered in practice, it is possible that a similar mechanism underlies other and commoner forms of shock.

CASUALTY SERVICES IN BARCELONA

SIX months ago some account was given [2] of the medical and other provision for refugees in Barcelona and elsewhere in Catalonia. Although an appalling shortage of necessities still exists, much has been done since that time to advance and reorganise the medical and social services to meet the emergency. Recently to the overcrowding and dearth of equipment has been added intensification of aerial bombardment of all coast towns and of Barcelona in particular. As many as 300 casualties, many in a dying condition, were recently brought to one hospital in the space of 15 minutes. It is natural that the existing civil hospitals, even with addition of the stadium which has been converted into a temporary refugee hospital, have proved inadequate to deal with the vast increase in emergency medical work of all kinds. The Public Health Council of Barcelona has now undertaken the courageous project of replacing the old dispensaries with a series of six completely modernised polyclinics, and of building in addition a large tuberculosis sanatorium and a home for incurables outside the city. In some cases it has been possible to convert pre-existing buildings—e.g., the old Bank of Barcelona by the Porta de la Pau—into polyclinics, but the construction of all follows the same general plan. They are of two stories, a central waiting-room on the ground-floor leading to consulting-rooms for general medical, pædiatric, and otorhinological cases, whilst the whole of one side is devoted to a large surgical department, including two operating theatres, X ray, and diathermy. On the first floor are similar departments for gynæcology, neurology, gastro-intestinal diseases, dermato-syphilology, and dentistry; clinical and bacteriological laboratories; dispensary; a six-bed ward for cases too ill to be moved to hospital; and accommodation for a doctor and two nurses. The construction of the buildings is now largely completed, but the equipment is proving very difficult, since almost the whole of it must be purchased in England with a greatly depleted currency.

[1] Wilkins, R. W., Weiss, S., and Haynes, F. W., *J. clin. Invest.* January, 1938, p. 41.
[2] *Lancet*, 1937, **2**, 929.

EMPLOYMENT DURING PREGNANCY

THE effects of industrial employment upon the health of the pregnant woman, her infant, and her other children has recently been studied by Dr. Margaret Balfour.[1] Many women continue to work after marriage in the pottery and textile trades and in her search for statistical information Dr. Balfour has therefore sought the help of the medical officers of health of towns in which these industries figure largely. Particulars were obtained through antenatal and infant welfare centres and health visitors from 3732 primigravidæ, 380 of whom were classified as weavers, 1743 as other workers for gain—in various occupations in the factory, shop, or domestic service—and 1609 as housewives employed only in their own homes. For each of these groups calculation was made of the maternal mortality-rate, the neonatal death-rate, and the stillbirth and prematurity rates. Between the home workers and the large general group of women gainfully occupied there appears to be no significant difference in these rates, but the rates of the weavers, with the exception of stillbirths, are substantially higher than those of the other groups. A further division of the general occupied group into standing and sitting workers suggests—the figures are not sufficient to do more—that relatively high rates of neonatal deaths and stillbirths characterise the standing group. Another subdivision of the data into those who left off work before the end of the sixth month and those who continued to work beyond that time indicates a disadvantage to the latter. Very little difference, however, is to be observed between the average birth weights of the infants born to these various groups of women. Dr. Balfour, therefore, concludes that gainful work other than weaving does not lead to unfavourable results in the mother but that damage to the child may well ensue if work is continued after the sixth month of pregnancy. In the weaving group it would be of some interest to ascertain, if possible, how the women compared with those not employed in weaving but living in the same towns; the present less controlled comparison is between weavers and a group more widely spread geographically.

In a second study [2] Dr. Balfour gives particulars of 1443 multiparæ, 410 being gainfully occupied and 1033 employed in the home. Of the children who had been born to the occupied group a slightly larger percentage were dead at the time of inquiry than was observed with the home workers. It seems difficult in this case to be sure which is the cart and which the horse. Possibly, more children may be dead because the mother is employed and therefore unable to give them proper attention; alternatively the mother may tend to remain

[1] *Publ. Hlth., Lond.* January, 1938, p. 106.
[2] *Med. Offr*, Feb. 12th, 1938, p. 67.

employed because a child is dead and she has therefore a smaller family to look after or is not tied by an infant. Dr. Balfour's own belief is that the mother should not be discouraged from work which in poor families is likely to secure better nutrition, better clothing, and more of the other amenities of life than is otherwise possible without family allowances; but that enough creches and nursery schools are required, together with school meals, to compensate for the mother's absence from home.

THE HEART ON THE SCREEN

HAVING shown us the activities of Finland and the unpleasant things that America is doing to her insect pests, the tenth and latest of the March of Time films proceeds to enlighten us on heart disease. It starts as a thriller with two sudden deaths, to a statistical accompaniment by the commentator. He tells us that heart diseases head the list of causes of death but are on the increase only because there are more old hearts to be affected. "Social infection," he says, accounts for 10 per cent. of cases, rheumatism for 30 per cent., and old age and hard work for another 45 per cent. We are shown the radiographer, the electrocardiographer, and the pathologist at work and, the high spot of the film, are allowed to listen to the clinician's stethoscope and hear the normal heart sounds with cavernous clearness, and a presystolic murmur like a roll of drums. There is too little of this, the only sound effect beyond the commentator's voice; more examples might have cleared the layman's mind for ever of the delusion that a stethoscope is merely a badge of office. We are then taken back into the childhood of Charlie Abbott, the owner of the drum-like murmur, and shown the youthful Charles complaining to his mother of growing pains and a few years later lagging behind his fellows on their bicycles. As a young man his job entails hoisting crates on a lorry, but his heart lets him down and he must submit for a time to the familiar doctor in the long white coat. But future Charlies will be better cared for; their growing pains are dealt with at special sanatoria and they have behind them the educational propaganda of the American Heart Association and the research workers of the Rockefeller Institute. A surprising amount of this wide subject is thus covered in twenty minutes, but perhaps the average member of the audience would have liked more of the tricks of cardiology and less of the slow movement of vast organisations.

MOTOR-HORN NOISES

THE official committee which under the chairmanship of Mr. G. W. C. Kaye, D.Sc., inquired into the noises associated with mechanically propelled road vehicles has just issued its final report, on motor-horn noises.[1] The 47 horns tested embraced all the types on the road to-day—electric and klaxon, bulb and wind-driven, sirens and electric gongs. Incidentally the two latter will henceforward be reserved for certain special types of vehicles, such as ambulances and fire engines. The main object of the tests was to ascertain, if possible, the chief factors contributing to the stridency and annoyance of horns, and the extent to which these are inherent in their efficacy as warning devices on the road. The committee accordingly analysed the sounds of the horns into their chief components, determined the overall loudness at a specified distance, and explored the sound field round certain of the horns. Some of these proved to be very directional in character, particularly those emitting sounds rich in high-pitched components. The loudness ranged from 82 to 113 phons measured from 20 feet in front, and from 80 to 104 phons measured from the side.

The first question was to ascertain how loud horns should be to enable the driver of an overtaking vehicle to attract the attention of one in front. Tests showed that "overtaking horns" as loud as 105 phons may be required to reach the ear of the driver in some types of car or light van or bus, while only very loud horns (110 phons or more) can get through to the driver of noisy lorries. The difficulty of evaluating the annoyance factor was that impressions of noise are personal to the individual and may differ profoundly among a group of listeners. Since legislation must be based on the views of the "average listener," more than 200 persons, varied in sex and age, were asked to set down their reactions in quiet surroundings to the different horns under one of the headings: unbearable, very objectionable, objectionable, tolerable, and agreeable. The report shows in a diagram the wide spread of the extreme opinions, though a majority consensus could be derived from the 30,000 observations without much difficulty. The observations were conducted with sustained notes, though the influence of interrupted or staccato operation was recognised. The next question was to find, if possible, one or more measurable physical factors which could be correlated with the annoyance assessments. No simple relation of this type could be deduced from the composition of the noise, though in general harsh noises containing high-frequency components were more annoying than equally loud musical sounds without such components. The only simple generalisation to emerge was the influence of loudness on the annoyance, a relationship which, despite certain anomalies, was found to supply a workable criterion. It appeared from these observations that the average pedestrian and other quiet occupants of a quiet street are likely to be annoyed by sounds louder than 95 to 100 phons from horns 20 feet away, and would certainly consider still louder horns offensively noisy.

The committee had to seek a compromise between the conflicting requirements of the several users of the road; they recommended a limiting loudness of 100 phons at a distance of 20 feet, believing that this would meet the requirements of most drivers and yet lead to a substantial diminution of the discomfort experienced by involuntary listeners. This limitation is likely to cause little inconvenience in the future if the previous recommendations of the committee on the reduction of motor vehicle noises are gradually adopted. Details are given in the report for carrying out the proposed tests of loudness.

The work of the committee has provided data which will be invaluable should it prove necessary to bring into force regulations designed to curb the activities of the unreasonable minority of road users who delight in unnecessary noise.

[1] Noise in the Operation of Mechanically Propelled Vehicles. H.M. Stationery Office, 1s. 3d.

CROYDON town council at its meeting on Tuesday evening decided to appoint a water engineer.

DR. GEORGE RIDDOCH will deliver the Lumleian lectures to the Royal College of Physicians of London on March 15th and 17th at 5 P.M. He will speak on pain of central origin.

WE regret to announce the death on Wednesday morning of Sir RAYMOND CRAWFURD, consulting physician to King's College Hospital and registrar of the Royal College of Physicians of London.

SPECIAL ARTICLES

HEALTH ASPECTS OF THE TRINIDAD DISTURBANCES

CONSIDERABLE public health interest attaches to the report [1] of the Commission appointed to inquire into the disturbances that occurred in Trinidad in June, 1937. The commissioners found on investigation that the causes of the disturbances had wide ramifications throughout the social structure of the colony. They traced the "true origin" of the trouble to a more or less general dissatisfaction of the workpeople with their social and economic circumstances, "an underlying current of resentment" due to various causes, one of the most important being "the deplorable conditions in which a large number of the labourers and their families are housed." Their report therefore gives prominent place to the health conditions of the colony, including the arrangements made for medical and public health services.

HOUSING CONDITIONS

Trinidad has an area rather less than Lancashire and a population of about 448,000, of whom some 150,000 are natives of India or their descendants. The great bulk of the remainder are of negro stock. About 43 per cent. of the people are unable to read or write. The main products of the island are sugar and cocoa, but there are valuable mineral resources—i.e., petroleum oil and asphalt, and oil now forms 59 per cent. by value of the total exports. Agriculture was formerly carried on with indentured labour, the employer being legally obliged to provide free housing accommodation for his labourers; and though the indenture system, which began in 1845, was abolished in 1917, the workers still feel that free quarters should form part of their conditions of service and it has become almost impossible to discontinue such provision. In practice this has perpetuated the old "barrack" dwellings, which generally consisted of a long wooden building roofed with galvanised iron, divided from end to end by a partition and subdivided on both sides into a series of single rooms. Unfortunately, this type of back-to-back dwelling seems to have been taken as a model for use elsewhere than in the agricultural districts. In Port-of-Spain, the capital of the colony, the commissioners visited barrack dwellings, let at monthly rents varying from 12*s*. to 15*s*. a room, which they found "indescribable in their lack of elementary needs of decency." The medical practitioners with whom the commissioners came into contact, as well as social workers and representatives of religious bodies, expressed strong views on the ill effects of the barrack dwellings on the mental, moral, and physical conditions of the workpeople; and the commissioners express agreement with the acting director of medical services not only that the erection of new barrack dwellings should be prohibited, but that the existing dwellings of this type should be swept away. They attach great importance to the housing question in Trinidad, saying "In no aspect of our inquiry have we been more impressed by the evidence placed before us and by our own investigations, than as regards the conditions in which large numbers of the working population, both urban and rural, are housed."

In such conditions it is not surprising that ankylostomiasis is prevalent. Some districts have an infection-rate of 80 per cent. The post-mortem records of the Colonial Hospital, Port-of-Spain, show that worms in enormous numbers were found in 50 per cent. of all East Indian adult patients. The incidence is highest in women. Malaria is stated to be the most formidable disease in the colony. Though it is not notifiable, 18,902 cases with 473 deaths were reported in 1936. Venereal diseases are widespread. The number of hospital admissions in 1936 was 1007, but these, it is stated, represent merely a small fraction of the existing cases. The vital statistics of the colony are more favourable than might be expected. The crude death-rate has declined steadily from 19·58 in 1933 to 16·28 in 1936, and infant mortality from 127 in 1934 to 97 in 1936. The maternal mortality-rate is estimated at 4·76 per 1000 pregnancies.

DEFECTS IN PUBLIC HEALTH ORGANISATION

Public health administration is carried out by the local sanitary authorities under the general supervision of the Central Board of Health. The director of medical services, who is chairman of the Central Board of Health, is the head of the Government Health Department, and for each of the two geographical divisions into which the colony is divided for health purposes there is a senior medical officer of health, who has under him a school medical officer and a venereal disease officer. These officers are full-time Government officials, and there are in addition a number of part-time district medical officers, who act also as secretaries of their respective local sanitary authorities. The report issued in 1934 of a committee appointed two years previously by the governor to consider reorganisation of the medical service of the colony was followed by changes in personnel among the senior officers of the Health Department, and the present director and deputy director of medical services have not yet completed two years in their posts. This factor must be borne in mind in connexion with the criticisms made by the commissioners. They confirm the view of the Medical Reorganisation Committee that public health duties should be in charge of whole-time officers who have no urgent prior claims of another character and cannot be suspected of allowing their private interests to conflict with their official duties. They found that in at least two cases the health officer of a district was the servant of an industrial undertaking operating in that district and regarded this arrangement as open to still greater objection than the combination of private practice with official duties.

In Trinidad there are two "colonial hospitals" maintained from public funds—the largest, the Colonial Hospital at Port-of-Spain, having 403 beds—six district hospitals, two emergency hospitals, a mental hospital, two houses of refuge, and a leper settlement. Patients able to pay are charged from 1*s*. to 3*s*. a day in the general wards and 10*s*. in the private wards, but many are admitted free. For the poor, free treatment is available at the out-patients' department of the hospitals and at dispensaries throughout the colony. The Government maintains two hookworm units, continuing the work carried on from 1914 to 1924 by the Rockefeller Institute, and anti-malaria measures, such as land reclamation, concreting drains, oiling, &c., are carried out. The usual methods of mosquito control are in operation.

RECOMMENDATIONS

The commissioners find many defects in the system of health administration. They think that the

[1] H.M. Stationery Office. Cmd. 5641. Pp. 120. 2*s*.

Central Board of Health, which meets about twice a year, serves no useful purpose, that the local sanitary authorities have not fulfilled their functions satisfactorily, and that in so small a colony the division of responsibility between the Central Board of Health, the local authorities, and the Health Department is open to serious objection. They recommend that the Central Board of Health should be relieved of its executive functions, if not abolished, that the local authorities in the rural districts should be abolished, and their executive powers, together with those of the Central Board of Health, vested in the director of medical services, who should have a staff with a sufficient number of full-time health officers as will ensure that the ordinary health work of the colony will be adequately carried out.

The report brings out the importance of health conditions as a factor that must be taken into account by those responsible for the framing of general public policy. It is not surprising that people living in the conditions described by the Commission should be a discontented people.

MEDICINE AND THE LAW

Post-encephalitis and Compensation

ON March 2nd at the Chipping Norton County Court a reserved judgment was given in an arbitration between Harry Booken, an assistant engineer of Chipping Campden, and the University of Bristol Fruit and Vegetable Research Station. The question of post-encephalitis following upon an accident arose, probably for the first time. On Oct. 10th, 1930, the applicant, then about 30 years of age, while in the employ of the respondents, got caught in the machinery as he was oiling bearings on a girder. His back was skinned in places, his chest and arms bruised, and his left arm violently wrenched. He is said to have suffered a head injury but never became unconscious. For three weeks following the accident he was unable to raise his left arm and shoulder. In December his usual medical attendant noticed that the muscles of the left side had wasted and that there was general stiffness when walking. He returned to work in the following January, but his left arm and shoulder pained him and he was unable to grip his tools as previously. The applicant left the employ of the respondents in February, 1932, and then worked in other employ until March, 1934, when he gave up work with a blacksmith. His medical adviser at that time noticed a tremor in his left hand and from then onwards he had gradually deteriorated in health and was now in a serious condition.

Dr. G. S. Hall, first assistant to the neurological department of the Birmingham General Hospital, called on behalf of the applicant, said he saw him on Nov. 2nd, 1937, when he was suffering from the after effects of sleeping sickness, or post-encephalitis. The symptoms were similar to Parkinson's disease. Witness said he thought that at the time of the accident the applicant had sustained severe injury to the muscles of both shoulders and upper limbs, especially the left. While suffering from the immediate after effects of the accident his progressive symptoms had set in. Witness believed that sleeping sickness starting before the accident had been lit-up by it, and that the applicant's present condition had been solely precipitated by the accident. He was not surprised that tremor had not developed before it did.

Dr. Ernest Bulmer, physician to the hospital, who also had seen the applicant on Nov. 2nd, 1937, was called by the respondents. He agreed with Dr. Hall that the applicant was suffering from post-encephalitis with parkinsonian symptoms. He had gathered from the applicant that he had suffered from influenza; that, he thought, was probably a very mild encephalitis. In his opinion the accident had no relation to the present illness but was a coincidence. He could only recall one case in which he had thought trauma had brought about encephalitis and there the patient was an old man. An additional factor supporting his opinion was the late appearance of the tremor. In cross-examination the witness admitted that trauma might precipitate encephalitis and that such an injury suffered by the applicant might precipitate the disease. He was, however, convinced that the applicant would have suffered from the disease in any case.

Judge Cotes-Preedy, K.C., in the course of his judgment, said he was satisfied from the evidence that the applicant before the accident was a man of ordinary health and strength, and that since the accident his health had gradually deteriorated. The fact that he was now suffering from a serious and somewhat obscure disease gave rise to a difficult question. After comparing and balancing the probabilities which emerged from the evidence he had come to the conclusion that the applicant had discharged the onus upon him and that the disease from which he was now suffering had been contributed to by the accident. He therefore found the applicant to be totally incapacitated and that the compensation of £1 0*s.* 2*d.* per week must commence as from April 1st, 1934.

PROTECTION OF X RAY AND RADIUM WORKERS

THE British X Ray and Radium Protection Committee has just issued its fifth revised report and recommendations,[1] a publication of considerable moment for all who are responsible for X ray installations, therapeutic, diagnostic, and commercial. The committee was set up in 1921 because public opinion had been much disturbed by a series of fatalities resulting from exposure to X rays and radium, and from its inception has been under the wise chairmanship of Sir Humphry Rolleston. It has drawn up special recommendations designed to protect workers against undue exposure to radiation, to minimise the risk of electrical shock, and to ensure adequate ventilation. In 1928, at the instance of this British committee, international recommendations for X ray and radium protection were adopted by the second International Congress of Radiology at Stockholm. These proposals, based on the principles laid down in Britain, have been revised at subsequent meetings held at triennial intervals of the international congress, and have been accepted in many countries. The last revision took place quite recently as a result of the work of the International Protection Committee which met under the chairmanship of Mr. G. W. C. Kaye, D.Sc., at the fifth International Congress of Radiology held in Chicago last September.

The safeguards urged by these committees are of real importance because experience has shown that even under modern conditions carelessness or inade-

[1] Obtainable from the hon. secretary of the committee at 32, Welbeck-street, London, W.1.

quate protection results in ill health, the most constant findings being a low average white blood-cell count. In previous reports it was pointed out that no figures for tolerance of exposure to gamma rays were available: in this report it is accepted that a person in normal health can tolerate with impunity exposure to X rays or gamma rays the equivalent of one international roentgen (r) per week. This is probably true; indeed the figure given is believed to leave a wide margin of safety for X rays. But so long as some doubt remains as to the difference in biological effect of the more penetrating radiation, it is to be hoped that every effort will be made not to exceed it for gamma rays.

With a view to preventing excessive exposure to X rays of technicians in therapy departments a method of remote control of the shutter is recommended, together with an interlocking device of some kind for the filter, and protective screens in applicators. A significant point made in this section is that full protection should be provided in all those directions in which the direct beam could operate dangerously.

The minimum equivalent thickness of lead for protection from X rays generated at different voltages is given, with interesting new data on the protection suggested for high-voltage installations. The difficulty of measuring the output for such apparatus is a problem similar to the measurement of gamma rays, and the tables on equivalent thicknesses of lead and other materials prepared by the National Physical Laboratory for both forms of radiation will be most useful to all those responsible for construction of rooms to house beam therapy and high-voltage apparatus. The only really safe method of handling large quantities of radium is by remote control, which introduces the radium into the container only after the latter has been adjusted to the patient. Now that beam therapy is being used in many hospitals, careful regulation is needed. In diagnostic work the chief danger is in fluoroscopy, and the introduction of a limiting device on the primary side of the apparatus to guard against excessive tube current during examination is another recommendation.

The prevention of accidents due to electric shock has been simplified by the almost universal use of shock-proof apparatus, but the application of non-shock-proof tubes in circuits excited by transformers operating with the mid-point of the secondary winding earthed is condemned, and attention is drawn to the risk of shock from alternating current mains, particularly three-phase installations and auxiliary equipment in dark rooms.

Two further important new recommendations, which are worthy of note, are the specification of the ventilation which should be provided in all X ray rooms, and a suggestion for the transmission of radium by post.

This report will be welcomed as a concise and complete account of the precautions necessary to protect radiological workers, and together with the National Radium Commission's publication on "The Care and Custody of Radium," is a complete guide to those responsible for the prevention of unnecessary risk to health.

LONDON HOSPITAL.—The quinquennial appeal of this hospital falls due this year and its bicentenary in 1940. It has therefore been decided to hold a combined appeal over a period of three years which will be opened by a festival dinner to be held on May 25th at the Mansion House. A scheme of extensions and improvements which will cost £300,000 is contemplated.

PROPOSED EXTENSION OF THE PHARMACOPŒIA

A COMMITTEE of the Pharmaceutical Society has had under consideration for some time past a list of proposed additions and deletions circulated by the British Pharmacopœia Commission. There is a tendency among manufacturing druggists to regard formulas in the Pharmacopœia as more binding than those in the Codex. At the present time there are many Codex formulas which are not accepted by some manufacturers, who continue to supply alternative preparations. Thus compound syrup of hypophosphites is being supplied containing no strychnine, and Easton's syrup tablets frequently correspond in strychnine content with the B.P. 1914 formula for the syrup and therefore contain twice the proportion specified in the Codex formula, which corresponds with the B.P. 1932 syrup. The transference of a preparation from the Codex to the Pharmacopœia results in the elimination of alternative formulas and ensures uniformity of composition. The committee of the Pharmaceutical Society therefore held it desirable that the B.P. 1941 should include as many formulas as possible for preparations commonly required by prescribers and the public. A further recommendation of the committee is that, since practically the whole output of many drugs such as aspirin and phenacetin is in the form of tablets, standards for these tablets should be included in the Pharmacopœia. After consideration of the report the council of the Pharmaceutical Society agreed to inform the Pharmacopœia Commission of these views and also to recommend that certain items, the omission of which from the Pharmacopœia was contemplated, should be retained; among the items in question are amidopyrine, dehydrated alcohol, dilute hydrobromic acid, the cinchona preparations, and potassium nitrate.

Following the submission of these recommendations a delegation from the Society met representatives of the Commission for the purpose of discussing the proposals more intimately. The Commission, we understand, is prepared to include in the Pharmacopœia an increased number of preparations of drugs of proved therapeutic activity, but not to include preparations solely on the ground that they are widely used. The list of preparations which the Society's committee proposes to suggest contains about one hundred items and comprises uncompounded drugs, elixirs, emulsions, extracts, injections, liniments, ointments, pills, suppositories, tinctures, tablets, and a number of miscellaneous preparations. The reason which has prompted these suggestions is that the methods of assay given in the pharmacopœial monographs for single drugs may not be applicable to preparations of these drugs; this is especially the case where interfering substances are present such as some of the lubricants used in the manufacture of tablets—e.g., stearic acid and cacao butter.

There is a recent precedent for the official recognition of tablets—namely, their inclusion in the Swiss Pharmacopœia, and while the revised edition of the French Pharmacopœia (Codex medicamentarius gallicus) which will become official on April 1st next does not specify tablets, it does contain a general monograph which describes how tablets should be made, lays down a test for disintegration, and limits the weight variability to 5 per cent. In view of the great and increasing extent to which compressed drugs are prescribed and supplied the Pharmaceutical

Society's committee is of opinion that the next edition of the British Pharmacopœia should provide standards more detailed than those of the Swiss Pharmacopœia and the French Codex and should specify size, shape, weight, and even colour.

In general the principle which underlies the Society's proposals is that since the British Pharmacopœia is regarded as a presumptive standard under the Sale of Food and Drugs Acts, it is desirable to include in it as many of the commonly prescribed preparations as possible. This would mean a more bulky work than the present one, but not so bulky as the new French Codex which is in two volumes and the index to which alone contains one hundred pages.

THE REGULATION OF MEDICAL PRACTICE IN AUSTRIA

(FROM OUR VIENNA CORRESPONDENT)

THE Government has just passed a new law regulating every legal aspect of a medical man's professional life; it will come into force on May 1st. The measure is the fulfilment of a series of demands made repeatedly by the profession for the last 40 years, and it finally settles many of their legal and professional problems. The present regulations date from over a century ago, and were only adapted bit by bit to later requirements, with unsatisfactory results. The new law leaves the subject of medical ethics for a special committee, which will be appointed by the representative medical bodies of all Austria, and will have to work out the code of moral obligations of doctors to each other and to the public.

The "Aerzte-ordnung," as the new law is termed, is divided into five parts. The first part defines for the first time in Austrian legislation "the medical profession," and enumerates the conditions required for the right to practise. The definition says that practice of medicine comprises curative treatment of diseased persons, diagnosis and giving of expert opinions on diseased conditions, prophylaxis, prescription of remedies for prophylactic, therapeutic, and diagnostic purposes, and for removing the ailments of the human body. (It thus does away with the difficulties of prescribing narcotic drugs, as mentioned in my Vienna letter of Dec. 4th, 1937.) The diagnostic or therapeutic application of X rays is expressly reserved for the medical man. Medical practice is reserved exclusively for qualified persons who must have the following: Austrian federal citizenship, a certificate of having passed the "Matura" examination before the year 1918 in one of the provinces of the former Austrian Empire, or after 1918 in the present Austrian State, or a diploma of M.D. obtained either in the old Empire or in the State. A "Matura" testimonial or a medical diploma conferred abroad is valid only if it is equivalent to one obtained in Austria and afterwards recognised in this country or in the old Empire. Furthermore, inclusion in the medical register is absolutely essential. The doctors already entitled to practise are required to register afresh within the six weeks after May 1st. Clinical assistants who cannot comply with these requirements—Austrian citizenship and a duly recognised diploma—are not allowed to practise except in their official appointments. Of course there is no objection to calling in a medical man from abroad for consultation, or to doctors from abroad taking up their studies in an Austrian hospital, but they must refrain from private practice.

The second part of the ordinance deals with the rights and duties of the "Arzt." This denomination is reserved strictly for those complying with the stated requirements. No other person may assume a similar title, such as natur-arzt, magnet-arzt, homœopathic arzt, or publicly use titles obtained abroad, unless permission is obtained. The designation "Facharzt" (specialist) will be conferred on those entitled to it by an ordinance shortly to be promulgated. Hitherto the local medical board has had a free hand in the styling, but the procedure will now be uniform. No doctor may practise regularly in more than one locality—i.e., there must be a single address. He must notify his consulting hours, and he may not see patients regularly in another office unless he holds an official appointment necessitating his presence in different places. Of course any doctor may act as locum tenens for certain periods and thus practise in two different localities without special permit, or he may see patients in consultation in any place. Seasonal changes in the place of practice—for instance by spa physicians—for a period not exceeding six months are permitted. The essential point is that no one is allowed to practise at will, now here, now there. The doctor must have a permanent address and must notify any change at once to the local medical board. He must not refuse to give first aid, unless very important obstacles prevent him. He must treat his patients conscientiously and give them the benefit of recognised scientific knowledge.

There is an important new departure in the law on professional secrecy. The principle of strictly confidential relations must be maintained, as hitherto, between doctor and patient. But the revelation of knowledge obtained in the course of professional work is legitimate and a moral duty if important public or private interests are involved. The doctor himself must weigh carefully the factors for and against. Many consider this possible disclosure of professional secrets as a serious and significant drawback of the new regulations. They were much more satisfied with the former etiquette that made professional secrecy an inviolable, absolute professional obligation. The doctor must not issue any certificate of illness or legal testimony not in accordance with the true condition, but if he gives a certificate he must state in it the purpose for which it is issued. Every consulting-room must bear a descriptive doorplate, which must be removed if the owner discontinues his practice for any reason whatever, and in this office the doctor must keep in store certain remedies for first aid, according to the type of practice. A doctor's name may be struck off the register permanently or temporarily. This may take place if he loses his Austrian citizenship or because of mental disability, or if he is deprived of his academic degree by a court of justice or an administrative magistrate. Temporary removal from the register may for instance be imposed on the doctor if he is guilty of serious malpraxis, and he may be ordered to submit to an examination in certain subjects before he is readmitted. An interesting clause stipulates that habitual inebriety and drug addiction may entitle the authorities to remove the victim from the register for varying periods or permanently.

The section dealing with the penalties for unqualified practice imposes a fine not exceeding 2000 shillings or imprisonment up to three months. This is a very important clause for it gives, for the first time in this country, an opportunity to combat quackery.

Hitherto this evil could never be eradicated, since the law required the proof of a regular, paid occupation, and the quacks were clever enough to slip through the wide meshes of such a net. Now they need not be summoned before a court, but can be sentenced by the local magistrates. The profession has received this new regulation with uniform satisfaction.

The last part of the ordinance describes the arrangements for the time of transition from the old regulations to the new, and deals with the regulations concerning the new medical register. It defines the rights and duties of the controlling medical body, the "Aerztekammer," as the only legal representative of the medical profession which will exercise a direct control of the ethical and moral standing of all men practising in Austria, thus ensuring real self-government by the profession, but as well it will defend and protect them against attacks and injury.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

A FORWARD LOOK AT NATIONAL HEALTH

SPEAKING on March 1st in Baltimore on the above subject Surgeon-General Parran restated emphatically the enlarged programme of public health administration which he advocates. The maintenance of health is not enough. Any disease which is widespread and which requires treatment beyond the means of the sick constitutes a public health problem. How, he asks, shall we face this problem in the immediate future? The gap between the acquisition of medical knowledge and its application is becoming smaller and will continue to decrease. Three factors contribute to this tendency:

(1) There is increasing concern in the welfare of the unfortunate members of society.

(2) There is increasing interest among lay individuals in medical discoveries and increasing confidence in the ability of medicine to serve human need.

(3) There is increased realisation of the financial stake which the community has in the preservation and restoration of good health.

The recent nation-wide survey and interdepartmental report have contributed to the wider understanding of the vicious cycle of poverty, ignorance, and disease. Public health is dynamic: to be satisfied with past progress is to regress. The federal government has made a start with the Social Security Act. While the federal government, however, contributes about 50 per cent. of the cost of old age pensions it contributes only some 10 per cent. of the cost of public health administration. Much is left undone. Dr. Parran cited several examples of neglect, among them the fact that in only two States is anything more than a gesture being made to prevent deaths from pneumonia with the new weapon of serum therapy.

In the immediate future, he continued, the federal government can—

(1) offer assistance on the basis of relative need in developing a real national health programme, building on the skeleton of existing health organisations, and wherever necessary creating new health organisations,

(2) assist in providing the physical facilities for medical care: hospitals, health centres, and so forth,

(3) assist in providing medical care to those who can afford to buy it.

In addition two further steps may be desirable. These are compensation for loss of wages through sickness and health insurance. Regarding the latter, Dr. Parran expressed the view that the more complicated becomes the provision of medical care (with the advance of knowledge) the less efficient is health insurance as a means of providing it. Health insurance may come but not, he believes, in the proximate future.

In concluding, Dr. Parran expressed his belief that the near future holds promise not only in diminishing the gap between our knowledge of what should be done and application of this knowledge, but also a great increase in medical knowledge. As each new weapon is forged the public will insist that it is promptly put to work.

TYPHOID CARRIERS IN NEW YORK STATE

There were 398 typhoid carriers under supervision in up-State New York, exclusive of those in State institutions, at the close of 1937, 18 more than were under supervision at the end of the previous year. That gives the State, exclusive of New York City, a rate of 0·66 per 10,000 population. During the year 43 new carriers were declared, while the names of 30 others were removed from the register. Of the carriers, 29 were discovered through epidemiological investigation of sporadic cases or outbreaks, 11 were found through the requirement of release cultures from cases of typhoid fever, 2 were discovered on evidence submitted by health departments outside the jurisdiction of the State Department of Health, and 1 was discovered accidentally. Of those patients who had onset of typhoid fever during 1936 and survived, over 4 per cent. were discovered to be chronic typhoid carriers. Of the 30 carriers whose names were removed from the register, 12 died. Seven were released from restrictions after submission of the required number of negative specimens, and 10 were removed because of change of residence to a community outside the State. One carrier was committed to a State institution. During 1936, 7 chronic typhoid carriers underwent operations in order to relieve their carrier condition. Three of these 7, however, continued to submit positive specimens last year and they remain unreleased. Three outbreaks of the disease during the year were traced to previously unrecognised carriers. An outbreak of 13 clinically recognised cases occurred in Schenectady in June and July of last year among 33 persons who had attended a Memorial Day luncheon. A woman, subsequently found to be a chronic typhoid carrier, had prepared salads which were served at the luncheon. Collected evidence pointed to these salads as the probable vehicles of infection. In Dutchess County 12 cases of typhoid fever occurred in January, 1937. The outbreak was shown epidemiologically to have been spread by raw milk and a chronic typhoid carrier was discovered among the milk handlers. Three cases occurred on a small raw milk route in Genesee County in August. A chronic typhoid carrier was discovered to be washing milk utensils on the dairy farm. During the year 9 cases of typhoid occurred which were believed to have been caused by previously known carriers. Of this number 5 were among household contacts of carriers. Four of these 5 patients had never been immunised; the fifth had been immunised ten years previously.

CONTROL OF PSITTACOSIS

Believing that the control of psittacosis can be achieved only by the suppression of psittacine birds as domestic pets, the public health council of New York State adopted on Feb. 18th last the following amendment to the State sanitary code: "The

importation, breeding or sale of birds of the psittacine family is hereby prohibited, provided, however, that the importation and breeding of such birds for scientific research or exhibition in public zoological gardens may be permitted subject to the approval of the state commissioner of health." This regulation was to take effect on the 1st day of March, 1938.

IRELAND

(FROM OUR OWN CORRESPONDENT)

REPORT OF THE HOSPITALS COMMISSION

THE second report of the Hospitals Commission—the body that advises the Minister for Local Government and Public Health on the distribution of the sweepstake funds—was published last week. The first report, published early in 1936, dealt mainly with 1933 and 1934, and the present report covers the next two years. Both do much more than detail the work done in the periods with which each deals, for the main object of the Commission is to plan an efficient hospital system for the country, and consequently it is concerned with the future as much as with the present. The new report has apparently been in the hands of the Minister for some time, since some of the matters on which he has now given decisions seem to have been still sub judice when it was written.

Like its predecessor the report gives a useful and understanding conspectus of the present hospital provision of the country, and well thought-out recommendations for future development. No doubt opinions will differ on the value of some of these, but every praise is due to Mr. M. W. Doran, chairman of the Commission, and to his colleagues, for the broad and long views they have taken of the problem with which they had to deal, and for the sympathetic consideration they gave to all representations made to them. The Commission repeats its recommendation in favour of a special development of the Dublin voluntary hospitals, to which the Minister's approval has recently been given. The necessity is stressed of closer coöperation both among the voluntary hospitals themselves and between the voluntary hospitals and the rate-supported, and examples of the ways in which coöperation would be both practical and helpful are quoted. The Commission welcomes the attempt made recently to form a hospitals association, but does not seem to be aware that this attempt has been checked if not frustrated by the opposition of the Minister's department. For the first time in a public document in Ireland one finds a reasoned attempt to distinguish the functions of the voluntary hospitals from those of the rate-supported institutions. The failure to recognise this distinction earlier led to a considerable waste of public money in the past ten or twelve years, a waste for which the Commission is in no way to blame.

Important recommendations are made about the development of special hospitals and services. A special chest hospital is advised for Dublin which should deal with the surgical as well as the medical treatment of pulmonary tuberculosis, and chest units should be included in the general regional hospitals of Cork and Galway. They would work in close coöperation with the several sanatoriums. In addition a hospital for non-pulmonary tuberculosis should be provided for Dublin. The problem of rheumatism is considered, and it is suggested that the facilities available at spas should be made available in the large centres of population by improved equipment of the physico-therapeutic departments of the hospitals. No doubt this is desirable, but it is very far from a solution of the problem. In regard to the treatment of mental diseases the Commission notes the need for mental clinics for early cases of disorder, and draws attention to the necessity for revising the lunacy laws. The Commission has undertaken an investigation into the incidence of mental defect and of epilepsy not associated with insanity. New statutory power will probably be required to enable the problem of mental deficiency to be solved. Among the most notable grants recommended by the Commission in the period under review are: National Maternity Hospital, Dublin, £89,180 for building; Rotunda Hospital, £107,474 for increased bed accommodation and reconstruction; the Coombe Hospital, £5000 for temporary additional accommodation; and a Hospital Library Service, £10,000.

MEDICAL CANDIDATES FOR THE SENATE

The Senate elections, both for those to be elected from the vocational panels and for those to be elected by the Universities, are now in process, and must be completed in the last week of the month. The Royal College of Surgeons in Ireland, being the only medical body to which was granted the privilege of nominating to the vocational panels, has taken its responsibility in a broad sense, and has nominated, in addition to one of its own fellows, a distinguished fellow of the Royal College of Physicians. Its nominees are Mr. R. Atkinson Stoney and Prof. T. Gillman Moorhead, past presidents of their respective colleges. In Dublin University Dr. Robert J. Rowlette, who was one of the University representatives in the Dáil since 1933, is one of the four candidates for three seats. Of the five candidates for three seats in the National University two are medical men—Mr. H. L. Barniville, a member of the former Senate, and Mr. Charles MacAuley. Both are members of the teaching staff of University College, Dublin, and they are colleagues as surgeons to the Mater Misericordiæ Hospital. It seems unlikely that the Senate will be left without at least one medical man among its members.

WIRELESS COMMUNICATION WITH AMBULANCES.—A new radio ambulance service has been started in Sydney, New South Wales, which will enable officers at ambulance headquarters to converse with men on cars as far away as forty miles. Not only will calls be answered more quickly but the rapid communication will make it possible to warn doctors, nurses, and hospitals about cases presently needing their care. The transmitter at headquarters has a power of 200 watts, and each car has a 10-watt transmitting set.

ROYAL MEDICAL BENEVOLENT FUND.—At a recent meeting of the committee three annuities and thirty-four grants were awarded. The total amount voted was £995.

One of the recipients was a doctor whose grant was renewed for the fifth year in succession. He is married and has one child of school age, and is quite unable to practise owing to paralysis. In his letter of acknowledgment he says: "It has not been possible owing to my paralysis for me to write to you before, but now I have a typewriting machine on which I can tap with one finger of my left hand. It gives me great pleasure to address you personally. I am truly grateful for all the Fund has done in the past and is doing at the present time on my behalf. The Fund is truly a marvellous Society. I do not like to think what our position would be without your magnificent help. I beg you to convey my own, and my family's, most sincere thanks to the Committee."

Subscriptions and donations are urgently needed and may be sent to the hon. treasurer of the fund, 11, Chandos-street, London, W.1.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM VRATCH

II

CLINICAL work is much the same the world over because the response to physical disease is little affected by race or climate; but the doctor's work is greatly affected by the social conditions, the administrative complexity (or over-simplicity), and even the climate in the area of his labours. Sometimes difficulties arise from issues quite outside the proper limits of medical activity.

When I was acting as a county council doctor in Russia (old régime) I had to cover single-handed an area about the size of Surrey and a population of at least 50,000 of half a dozen different races. The problem was to distribute the small amount of medical aid where it would be most effective and was most needed, irrespective of other considerations. A few outlying clinics were established (at about twenty miles from the central hospital) which I visited on weekly rounds so as to save patients the burden of travel; they were placed after careful consideration of the population and general healthiness of the neighbourhood. To prevent unnecessary delays I stopped at villages en route to these clinics only if I had previous notice of illness that must be seen at home, or if more than a handful of out-patient cases was reported.

* * *

One route passed through a small village of independent colonists from Little Russia, people of vigorous disposition and, as it happened, good bodily health. The Headman of the village, who had seen me drive through several times, requested me to place a clinic in his village, but I declined on the ground that his village was small, quite near another clinic, and, above all, remarkably healthy. He offered to provide a room free: "And would you," I asked, "let me see all comers there?" "We certainly would not, it would of course be for our own people!" It would be a disgrace, he added, for his villagers to mix themselves with the ordinary peasants among my out-patients; his people were above such mud and desired special consideration. He admitted that one of his chief reasons for wanting the clinic was prestige, as he had promised his villagers that he would obtain it. I refused on the ground of medical urgency elsewhere.

The next time I drove through on my round I noticed an unusual number of dogs barking, and realised that they were being set on us. The horses, though frightened, kept up a good pace. One of the wolf-like beasts nearly got on to the sledge, but having to run after us it did not quite manage the final leap. Shortly after I received a note from the Headman. Would I open a clinic? I again refused, and resolved next time to go through his territory prepared. A week later my driver asked if I would not make my round by another way; but this I would not do, and we set out.

* * *

There are few things pleasanter than a sledge drive across the Steppe on a sunny morning. There is a sting in the air, the snow under the runners squeaks crisply, and the muffled thumping of the horses' feet and the rocking of the sledge over the undulating ground produce a peaceful contentment. The best kind of sledge is one with a level floor big enough to hold a truss of hay, which, skilfully spread out and covered with sheepskins, is more comfortable than any contrivance of seats and springs. By jamming one's feet in one corner, sprawling diagonally across the sloping mound of hay and bracing one's shoulders into the opposite corner of the back one can by a quick stiffening of the body grip the sledge, as it were, when it crashes into a deep bump or heels over on an incline, and one's arms are free to be tucked into the long sleeves of the sheepskin outer-overcoat. The shaft horse is attached only at the collar, the shafts being kept very wide apart by the great arch of wood on which the bells are hung. The traces of the leading horse are long enough to leave eight or ten feet between the leader's tail and the shaft horse's nose, so that the leader can swerve round bumps and pot-holes and pull the forward end of the shafts into the right direction. This also permits the leader to pick a good surface by allowing him a wide lateral range of movement. But the leader must have good nerves, for if he runs wild the sledge will crash, the shafts be broken, and the curved-up front of the runners may break the shaft-horse's legs. The distance between the horses necessitates two whips, one with a thong about 6 ft. long for the near animal, and one about 30 ft. long for the trace-horse. These whips dangle from the driver's wrists, and their long thin strands of twisted leather ride over the snow with an arching and rippling movement like attendant serpents keeping pace on either side of the sledge.

* * *

On this morning our horses slowed down at a hill and rested at the top. Below us lay the village we must pass through. The wall and fence that surrounded it were banked up into sloping ramparts of snow, cut by the road that passed through the middle of the village, which was guarded by a gate at either end. It was a quiet scene and I noticed that both gates were open. The driver started the horses and we raced down the hill at a full gallop. He went through the first gate superbly, and we were doing the quarter mile of village street at a speed and in a style that Russians love. When we had gone part way through the village they let the dogs loose. This time the dogs bore down upon us from the front so that they had the advantage of a springing attack. They worried the horses, which slowed down enough to make it possible for the brutes to jump full on me and to get over the back of the low-built sledge. I had disconnected the two portions of a cranioclast and held them in readiness. I got up and, standing by the driver, dealt with those that came upon us from the sides, while he with the whips tried to keep them clear of the horses. Then, to my surprise, the villagers, who had stood and watched the scene, whistled to their dogs; this caused a momentary distraction which allowed the horses to spring into a gallop.

But the villagers had not done with us yet. There was the second gate to shoot through, and some of them standing nearby released more dogs at us from the flank in order to head the trace-horse up the rise of snow that had banked up to the level of the top of the wall, where an overturn would have been inevitable, and a ghastly mauling by dogs a certainty as we floundered to our feet. The horses were in

panic, the sledge was swerving from side to side of the road, but by masterly driving they were kept off that dreadful slope, and we made a clean exit through the open gate.

The rest of the day was uneventful.

* * *

Some weeks later I was called from supper. Would I go *at once* to a desperately ill woman? A fast sledge had been sent for me and the village was only twelve miles away. Without thought or discussion I stepped into the sledge, and was driven off at a fine spanking pace. I soon saw that the route lay towards that village. Then I noticed little details: the carriage of the driver's head, the cut of his coat, the shape of the sledge—all seemed familiar and yet made the pattern of a culture that was different from the usual one in my neighbourhood, and I realised that I was going not through but *to* that village.

We drew up at the Headman's house and I was led straight to his mother who was certainly very ill with pneumonia. I did what could be done about diet, explained about nursing, and then wrote a prescription to be made up at my hospital. As soon as that was done the Headman said "And now about that clinic!" I told him the answer was the same, and further that to set dogs on doctors was not the way to get a clinic. "Very well," he said, "if you don't consent you can get home by yourself, my horses shall not take you and I am not going to be responsible for what the dogs do to you." To his shame this was said in his mother's hearing. I saw only one way out of the difficulty, apart from agreeing to set up a clinic where he wanted it, and not where it was needed. Acting instantly on the knowledge that a prescription is regarded by these people with superstitious reverence, I replied, "The burden of that decision falls on other shoulders" and tore the prescription to pieces. To my shame this also was said and done in the patient's presence. He took the dreadful blow to his mother with steadiness and said quietly that I had beaten him. I immediately promised to send the medicine at once on my return to the hospital if he would have me driven back and no more dogs were set on me. I said I would visit serious cases in his village as I was doing at that moment and would stop on my way through if requested in the customary way; but no clinic, and no more dogs. He kept his bargain and I mine. I do not know what happened to his prestige.

* * *

These hardy, independent people were a fine set of men, if somewhat rough. It is a misfortune for which individuals are not to blame that when an aggressive attitude towards life finds outlet in communal action the leaders of the group are often rich in cunning, though poor in wisdom. The people I have described had different but equally admirable qualities from the more numerous, more lazy, more gregarious village-peasants of Great Russia; unfortunately the two types did not get on well together. The world now knows such sturdy independent farmers, in the heart of Soviet Russia, by the name of *Kulaks*, and I for one who saw something of their mettle regret, but nevertheless can understand some of the reasons for, their liquidation.

PUBLIC HEALTH

INFECTION AND EXCLUSION FROM SCHOOL

AT a discussion on infection and disinfection held by the Society of Medical Officers of Health on Feb. 18th, Dr. Hugh Paul of Smethwick developed what he termed the "rather revolutionary thesis" that healthy children who have been in contact with others suffering from infectious disease should not, for this reason, be automatically excluded from school. Exclusion, he holds, should only be enforced in the extremely rare event of a school medical officer or practitioner finding some special reason to justify the step. Dr. Paul's suggestion is intended to apply only to urban areas with "dense aggregations of more or less working-class populations" and not to rural districts or "to prisons or institutions where discipline can be enforced from above or large public schools where money is no object." Thus, closed or semi-closed communities are excluded from his remarks and neither prisons nor opulent public schools, if such exist, need here be considered.

Although for nearly a year, he tells us, Dr. Paul has practised in a crowded industrial area what he now preaches, he notes that even in such an area expediency may dictate exclusion, and he admits that with small-pox expediency would govern his own procedure. He reminds us that children are excluded from school for three reasons: (1) they are actually suffering from some disease, infectious or otherwise; (2) they have been in contact with somebody suffering from an infectious disease; (3) they live in a house in which there has been an infectious patient. He appears chiefly to have in mind children who have been exposed to diphtheria or scarlet fever; he does not mention measles, or that in London anyhow, since 1934, home contacts with measles have been allowed to attend school "provided that arrangements can be made for their examination daily by the school nurses, the children concerned being also kept under observation by their teachers."[1] The reasons given for the adoption of this policy by the London County Council were that "apart from the effect upon school attendance, it is reasonable to assume that the attention of the borough medical officers of health was drawn to cases of measles earlier than if they had been excluded from school and since pre-school children are more severely affected by an attack, if contacts are permitted to attend school they are less likely to infect the younger children at home." Since children must go home to sleep, probably under crowded conditions, this last point may not be a very cogent one; but the conclusion reached and acted upon in London, that there are advantages in healthy contacts remaining in attendance at school provided that they are kept under careful supervision, shows that Dr. Paul's proposals are not so revolutionary as he supposes. Now measles is an intensely infective disease with a fairly long incubation period and, during its epidemic phases at least, one which occasions a fatality-rate equal to those of diphtheria and scarlet fever combined. On the other hand, diagnosis, especially if a history of contact is forthcoming, is easy, and although, as has been shown by P. Stocks and by J. L. Halliday, subclinical infections resulting in temporary latent immunisation occur, carriers of measles, other than transient or contact carriers of the virus, are unknown. It is true that diphtheria and scarlet fever have short incubation periods; they are far less infective than measles, close or repeated personal contact

[1] L.C.C. Report on measles epidemics, 1933–4. No. 3180. London, 1936, p. 9.

being necessary for transmission, but *formes frustes* are of frequent occurrence and clinical diagnosis is not possible for teachers or school nurses and, without bacteriological assistance, may even be difficult for the doctor; chronic carriers abound. The suggestion has never been made that the hospitalisation of measles is a preventive measure of any value; that the hospitalisation of diphtheria and scarlet fever would diminish incidence was at one time hoped, but the hope has not been realised. The continued prevalence of these diseases, in spite of a high isolation-rate, is due to the occurrence of *formes frustes* and to the existence of carriers far outnumbering cases clinically recognisable. The detection here and there among the open community of healthy carriers of the diphtheria bacillus or the hæmolytic streptococcus and their segregation is labour in vain, since these measures cannot affect prevalence, and indeed the presence of healthy carriers in the community tends to maintain herd immunity. Assuming that the infecting clinical case of diphtheria or scarlet fever is effectively isolated at home or removed to hospital, is there any point in excluding familial contacts from school for the traditional quarantine periods? This depends upon whether expediency—i.e., pressure of public opinion—or control by modern methods is to govern the situation. In a children's ward it is possible by means of the appropriate intradermal tests, swabbing for the detection of carriers, and passive immunisation of positive reactors to control an outbreak of diphtheria or scarlet fever and to readmit fresh patients within 48 hours or less. Whether such measures applied to familial contacts are feasible and, if so, expedient, is a question for individual medical officers of health to decide; but even without them, there is much to be said for Dr. Paul's practice. Considering the numbers at risk and the conditions under which these risks are run in crowded tenements, multiple familial cases of diphtheria and scarlet fever are remarkably few. They are not likely to be more numerous if the child, under daily supervision, attends school, especially if the appropriate modern methods of specific discrimination and control have been previously carried out in his home. It is better for the child to attend school than to play with his friends in the street. Any idea that the excluded child is really segregated by the mother may, as Dr. Paul points out, be dismissed. Every general practitioner is aware that in the average working-class home such segregation is impossible.

Appropriation of L.C.C. Institutions

Six public health institutions under the London County Council have not yet been appropriated for the reception of the sick—namely, Fulham, St. Alfege's, St. Mary Abbots, Hackney, St. Leonard's, and St. Pancras. During the next few weeks the remaining able-bodied and healthy inmates will be transferred to public assistance establishments and by April 1st the appropriation can be effected. The council will then have removed its hospital service entirely from the ambit of the Poor Law. After appropriation these institutions will form part of the adjoining hospitals.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 26TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2429; diphtheria, 1565; enteric fever, 18 (30 "expected"); pneumonia (primary or influenzal), 1188; puerperal pyrexia, 188; cerebro-spinal fever, 29; acute poliomyelitis, 6; acute polioencephalitis, 1; encephalitis lethargica, 4; dysentery, 214; ophthalmia neonatorum, 115. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 4th was 5008, which included: Scarlet fever, 819; diphtheria, 1277 (carriers 41); measles, 1542; whooping-cough, 277; puerperal fever, 15 mothers (plus 8 babies); encephalitis lethargica, 284; poliomyelitis, 1. At St. Margaret's Hospital there were 32 babies (plus 12 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there were no deaths from small-pox, 1 (0) from enteric fever, 50 (13) from measles, 2 (0) from scarlet fever, 16 (2) from whooping-cough, 34 (3) from diphtheria, 66 (22) from diarrhœa and enteritis under two years, and 59 (11) from influenza. The figures in parentheses are those for London itself.

Barking reported the only death from typhoid. Birkenhead, Salford, Wigan, and Bristol each had 3 fatal cases of measles. Birkenhead also reported 6 deaths from whooping-cough, Liverpool 3. Diphtheria was fatal in 21 great towns, Liverpool reporting 4 deaths, Manchester and Birmingham each 3.

The number of stillbirths notified during the week was 267 (corresponding to a rate of 37 per 1000 total births), including 36 in London.

THE LANCET 100 YEARS AGO

March 10th, 1838, *p.* 871.

A petition to the House of Lords on the abolition of imprisonment for debt.

The humble Petition of the British Medical Association, Showeth—

That the Bill now before the Committee of your Lordships' House, intituled, "An Act for extending the Remedies of Creditors against the Property of Debtors, and for abolishing Imprisonment for Debt, except in certain Cases of Fraud," will, if passed (in its present form) be most injurious in its effects to the members of the medical profession:

That medical men are very differently circumstanced from other persons as to the mode in which credit is often obliged to be given. Members of the legal profession, merchants, tradesmen, &c., have it in their power to exercise due discretion as to whether they will give credit or not, by first inquiring into the character and circumstances of the parties, and as to their probable means of payment; whereas it is well known that your Petitioners are called upon to attend sudden and urgent cases, admitting of no delay, and which it would not only be inhuman in them to refuse, but such refusal would subject them to considerable odium and disgrace:

That there is in London, and in most of the large towns in England, a very extensive class of persons who, under the above circumstances, may contract debts, and yet are wholly exempt from the remedies which by the Bill are intended to be given to the creditors against the property of their debtors, namely, clerks in Government and public offices, warehousemen, mechanics, and other artisans, whose salaries and incomes are considerable, but who possess no tangible property which, under the provisions of the projected Act, could be assigned for the benefit of creditors:

That your Petitioners, under the existing law, sustain losses greater by far, in the aggregate, than persons unacquainted with the facts could well imagine, and which losses they believe would be much increased if the present Bill should pass into a law in its present form:

That with the view of meeting the increased risk which the abolition of imprisonment for debt must necessarily produce, your Petitioners humbly beg leave to suggest to your Right Honourable House, that it may be made competent for a judge, on the application of a judgment creditor, to order that so much of the salary, wages, or income, of the debtor, shall, from time to time, be appropriated in liquidation of the judgment debt, as to such judge may seem fit and proper, or that your Right Honourable House will be pleased to make such other provision for carrying into effect the desires of your Petitioners, as to your Right Honourable House may seem most expedient.

And your Petitioners, as in duty bound, will ever pray, &c.

CORRESPONDENCE

GAS-AND-AIR ANALGESIA

To the Editor of THE LANCET

SIR,—I have read the letter from Dr. J. Elam in your last issue with great interest, and I wholeheartedly agree with him about the importance of attention being paid to small details. In my experience inadequate analgesia has only resulted in those cases in which some error of technique has been committed by an attendant not thoroughly conversant with the method. The course of instruction that institutions approved by the Central Midwives Board are now giving to midwives and pupils, followed by an examination to test their proficiency, should ensure that patients receive the best available relief. The Liverpool Maternity Hospital provides a course which is very thorough, and I would have every confidence in anyone who obtains a certificate after examination in obstetric analgesia from this hospital. Messrs. Baillière, Tindall and Cox will shortly publish a small book for me on gas-and-air analgesia, which ought to be a great help to medical practitioners and midwives who are interested.

I am, Sir, yours faithfully,

Liverpool, March 5th. R. J. MINNITT.

To the Editor of THE LANCET

SIR,—In your issue of March 5th Dr. Elam describes methods of increasing the efficiency of automatic "gas-and-air" machines for obstetrical analgesia. His views are of considerable interest to me, for a year ago (*Lancet*, 1937, **1**, 615) I attempted to analyse the reasons for the erratic effect of these machines, and suggested a means whereby a more efficient analgesia could be obtained which more nearly coincided with the time of onset and duration of a labour pain.

Dr. Elam's observations are of considerable importance, and, in particular, I agree that the efficiency of the analgesia can be increased if the patient continues to inhale the gas mixture in the intervals between her pains. In my experience, however, I have found that it is difficult to persuade the patient to do this—often, indeed, it is even difficult to induce her to make the necessary inhalations *during* a pain, especially when the bearing-down reflex becomes strong.

It is also true that an increased efficiency can be obtained if the proportion of nitrous oxide inhaled is increased to 60 per cent. Dr. Elam states that he is quite sure that no ill effects can result from using a mixture of this strength, but until this claim is supported by strong evidence, a prolonged reduction of oxygen intake from 20 per cent. (as in normal air) to 8 per cent. must be regarded as a serious matter. The resulting anoxæmia can scarcely be beneficial to the mother, and if it is maintained during the actual delivery, must surely be prejudicial to the safety of the fœtus.

If Dr. Elam's line of reasoning is continued, one might use inhalations of pure gas in order to get a quick and pronounced analgesic effect. This is the method which I have previously recommended; safety from asphyxia can be obtained by a device which prevents the inhalation of more than 110 ounces of gas (2 or 3 deep breaths) at one time. Such an apparatus has been made for me by Messrs. A. Charles King and Co., and was described in the article mentioned above. Both portable and standard models are now available. Provided that the patient has sufficient self-control to take three deep breaths at the first warning of each renewed pain, a useful degree of analgesia can be guaranteed. Continued experience has convinced me of the value of this method, and I am satisfied that the results are distinctly superior to those which I can obtain by use of the usual gas-air mixture.

In a recent annotation (*Lancet*, Feb. 26th, 1938, p. 508) you mention my method but imply that it is not suitable for use by midwives. It is true that no effort has yet been made to bring the new machine to the notice of the Central Midwives Board, but it is wrong to suppose that it is unsuited to the needs of domiciliary midwifery. When the precautions are observed on which the Central Midwives Board insists with regard to the gas-air type of apparatus, the new machine is at least as safe, and is, I believe, simpler and considerably more efficient in use.

I am, Sir, yours faithfully,

CHASSAR MOIR.

Department of Obstetrics and Gynæcology, University of Oxford, March 7th.

MATRIMONIAL CAUSES ACT: THE DOCTOR'S EVIDENCE

To the Editor of THE LANCET

SIR,—The first cases under the new Matrimonial Causes Act will shortly come before the courts, and medical practitioners being to some extent affected by the provisions of the Act, it is interesting to examine the position. Evidence from medical practitioners will be required under Sections 2 (*d*) and 7 of this Act. Section 2 (*d*) provides that "a petition for divorce may be presented to the High Court . . . on the ground that the respondent is incurably of unsound mind, and has been continuously under care and treatment for a period of at least five years immediately preceding the presentation of the petition." As to whether a practitioner can say that any given person is "incurably of unsound mind" is of course for him to judge.

The real question affecting medical practitioners under this section of the Act is, Does the usual relationship of doctor and patient exist in such cases? It may be said that the patient does not voluntarily come to the doctor under whose care he or she will be, whether in a private or public institution. A patient is placed under the doctor's care by some person or authority who is responsible for the patient—whether it be a relation or a local authority matters little. It may be argued that the doctor is responsible not to the patient but to the person who employs him for the purpose of caring for the patient. In ordinary circumstances presumably a doctor without hesitation would give information regarding the health and prognosis of a patient to a husband or wife. Is, therefore, the extent of the information sought, or the purpose, a factor to be considered by a practitioner in giving or withholding information? It must be remembered that under the Act the interests of the patient in the event of a petition for divorce are safeguarded either by the patient's Receiver or the official solicitor, and the financial provisions of the old Act are made applicable to the new Act. Will the doctor by giving such information be committing a breach of professional secrecy? By refusing, he will be stultifying the law, particularly so far as poor persons are concerned, for

the poor person will not be able to afford to requisition the services of a practitioner from outside the institution to examine the patient with a view to certifying, although those in more fortunate circumstances may be able to do so. Even in the latter case, the outside practitioner could hardly form an opinion without being granted access to the records of the patient. It has been suggested that those practitioners working at municipal mental hospitals may seek to cover themselves by getting their visiting committees to direct them to give such information. Even if it were desirable that practitioners should shelter from their responsibilities in this way, would it safeguard a practitioner from a charge of breach of patient's privilege?

Section 7 is easier. Under it, suits for nullity may be brought on the grounds that either party was at the time of the marriage of unsound mind or a mental defect within the meaning of the Mental Deficiency Acts 1913–1927, or subject to recurrent fits of insanity or epilepsy, or at the time of the marriage suffering from venereal disease in a communicable form, or at the time of the marriage pregnant by some person other than the petitioner. Obviously, here a practitioner must not give information obtained as a result of professional attendance except with the consent of his patient or under the direction of a judge.

It may be said that it is not the business of the medical practitioner to obstruct the law, but before they facilitate the law, practitioners are entitled to know that their own interests are not jeopardised. The questions referred to above are of considerable importance as they raise new problems on the much discussed question of professional secrecy.

I am, Sir, yours faithfully,

RICHARD W. DURAND,
Secretary, London and Counties Medical Protection Society, Ltd

Victory House, Leicester-square, W.C., March 7th.

EPILEPSY AND ELECTRIC DISCHARGES

To the Editor of THE LANCET

SIR,—In a leading article in your issue of Jan. 29th, it was stated that in a paper just published in *Brain* [1] "Gibbs, Gibbs, and Lennox of Boston maintain that their observations on electrical discharges from the brains of epileptic patients demonstrate 'the pathological physiology of epilepsy to be a paroxysmal cerebral dysrhythmia.' This confident conclusion reflects the tone of their whole paper and brings it into contrast with that of Golla, Graham, and Walter [2] in which a more cautious attitude is expressed in the admission that 'at the present stage no definite pronouncement is possible as to the significance of the delta-wave foci in epilepsy.'" The article then states that not only is there "no apparent disagreement in the observations of the two groups," but "the technique is much the same in all laboratories," and suggests that the conclusions of the Boston workers are premature.

I am fortunate in having been in close contact with both groups of workers for whose work I have the highest possible regard, and have spent the last six months in Boston applying Walter's technique to Gibbs's material. Gibbs and his co-workers have studied the cortical potentials related to seizures, both clinical and "sub-clinical," and are investigating the biochemical factors influencing such abnormal cortical activity. For this reason it has not been their purpose to demonstrate and to localise foci of disturbance, although these have been repeatedly recognised and have been described by them.[3] Walter has shown that by recording changes in potential between different areas of cortex, foci of abnormality can be accurately localised [4] and he therefore adopted this technique. Gibbs, on the other hand, has compared the alternating potentials of cortical areas with those of an inactive area, thus obtaining a record of the absolute change in potential, and not of intercortical potential differences, as did Walter.

The resulting electrical patterns produced by the two methods are entirely different, but they each serve their purpose admirably, that of Walter to localise abnormalities, that of Gibbs to study the underlying metabolic phenomena. Gibbs has investigated mainly the seizure potentials and Walter the potentials between seizures. Again, Walter has recorded for sufficient time to establish the position of an abnormal focus of discharge accurately, while Gibbs has recorded changes in the cortical potentials from standard positions on the cranium continuously for periods up to 30 hours, using an ink-writing oscillograph. Such a method would have been unsuitable for Walter's purpose. The approach and the technique of the two groups of workers have, therefore, been different, and their observations must be correlated and not contrasted.

It is evident that Gibbs's conclusions are amply substantiated by his observations, accumulated during the last three years and published in a logical sequence of six papers.[1] Although it is true that cortical behaviour has been investigated electrically for so short a time that conclusions must be drawn with caution, these conclusions cannot be refuted by data obtained with a different technique and for a different purpose, and it is unfortunate that the conclusions of such well-known groups of investigators should have been contrasted so critically at the present stage of our knowledge of the cortical electrical disturbances associated with epilepsy.

I am, Sir, yours faithfully,

DENIS WILLIAMS.

Department of Neurology, Harvard University, Feb. 21st.

INTRAVENOUS INJECTIONS IN INSURANCE PRACTICE

To the Editor of THE LANCET

SIR,—The note in your current issue (p. 582) on "Within the Scope" reminds me of something which occurred some years ago when I practised in another county. The medical officer of health of that county sends out annually to all practitioners a letter about the treatment of venereal diseases. In this he states that practitioners may be supplied with arsenicals and other preparations provided they have held or hold certain specified appointments or have done a special course at, among other places, an army hospital. I have given in my time several hundred injections but I was not entitled to be put on the list for free supplies as I did not fulfil the exact requirements as laid down by the Ministry of Health. However, as I am in the Royal Naval Volunteer Reserve I wrote to the medical officer of health and asked if I would qualify if I were to work in the V.D. department when next I went for training to a naval hospital. I received a reply that the

[1] Gibbs, F. A., Gibbs, E. L., and Lennox, W. G., *Brain*, 1937, **60**, 377.
[2] Golla, F., Graham, S., and Walter, W. G., *J. ment. Sci.* 1937, **83**, 137.
[3] Gibbs, F. A., Lennox, W. G., and Gibbs, E. L., *Arch. Neurol. Psychiat., Chicago*, 1936, **36**, 1225.
[4] Walter, W. G., *Proc. R. Soc. Med.* 1937, **30**, 33.

Ministry of Health recognised a course in an army hospital but not in a naval one.

It seems to me that this attitude of the Ministry, if correct, covers the case described by you. If only special practitioners are considered capable of being trusted with N.A.B., &c., a course of injections from an insurance practitioner must be against the rules, unless he has fulfilled the requirements as regards courses and appointments. If he has, then he must officially possess special skill and is therefore entitled to his special fees.

I am, Sir, yours faithfully,

Croydon-road, S.E., March 5th. E. E. D. GRAY.

STERILISING FILARIAL WORMS BY POISON

To the Editor of THE LANCET

SIR,—In an article in THE LANCET of March 5th, dealing with a man whose blinding onchocerca infection was contracted in Africa and proved in Liverpool, Dr. A. R. D. Adams makes a point, important for pathology and treatment, which will not, I think, be accepted in the future. Dr. Adams concludes that these larvæ are rapidly destroyed by certain antimony compounds, but that these have a complete lack of effect on adult worms, which put out new broods to take the place of those the drug has killed. I have collected the evidence for the action of drugs on two other filariæ [1] and for one of them, *Dirofilaria immitis* the heart worm of dogs, O. K. Khaw and Stephen Hay Chew [2] found a like disappearance of microfilariæ, in this case from the circulating blood; but analysis of their careful records shows that in every case in which the dogs were killed during the absence of microfilariæ from the blood, live female worms were indeed present in the heart, but were sterile. They had been so gravely poisoned that microfilariæ were not even being formed by them. Knowing what we do know of the way in which the active cells of the reticulo-endothelial system do their work, the reasonable explanation of the disappearance of microfilariæ from the blood of these dogs on the exhibition of the drug is surely that, as is the normal way of working of these cells, the microfilariæ then in the blood were promptly destroyed, while the effect of this poison on the ovaries of the worms was such that for a time these active reticulo-endothelial cells had no microfilariæ to deal with—I say for a time, because in all dogs who lived long enough, microfilariæ again appeared in the blood. In the same paper I suggested that the temporary disappearance of *Microfilaria bancrofti* from the blood of man for a month after injection of amino-arseno-phenol by F. Noc [3] may well have been due to the same cause, poisoning of the mother worms to the point of temporary sterilisation.

At the risk of being tedious I repeat once more that if microfilariæ are promptly destroyed by the mobile cells in question as soon as they are born, then enforced activity and multiplication of cells, whose developmental end is the fibroblast, must radically alter the views of many on the essential pathology of the diseased condition; for, as I see the microscopic changes which take place in lymph nodes which are dealing with *Mf. bancrofti*, they are just those from which the gross changes found in that infection will certainly follow; and of those changes fibrosis and its results are the most conspicuous. Fibrosis, local round the adult worm, is equally the conspicuous but not invariable tissue change in onchocerca infection. Is that too due to the host's reaction to microfilariæ born from the adult female? The capability of these microfilariæ for harm seems to be made evident by the changing corneal condition in Dr. Adams's patient as their numbers varied, so the question is raised—Does Neostibosan sterilise temporarily the female onchocerca and was that the cause of the relief which followed its administration in this man? The answer to that question seems to me to have a possibly wide importance in filariasis, for the clearer the knowledge of the mode of action of drugs, the more likely are we to be able to compare drug with drug with a view to finding out which is the best for any purpose; and in onchocerciasis with nodules the position of worms in the host's body is by that very fact disclosed. It is then possible, in persons with more than one nodule, to excise one, and after adequate treatment with any drug which has at least lessened the number of microfilariæ in skin or conjunctiva, to excise another, and to note the condition of the female worms in both instances. One proviso seems necessary. It has been felt that the fibrous coat round a nodule is so dense that microfilariæ cannot be expected to penetrate it. It might then be suggested that if they cannot get out, a drug might not get in. But so long as the worms are living they must be getting nourishment, and that they should get this amply is more necessary in order to meet the needs of a female producing numbers of microfilariæ. Since then lymph carries food into nodules, it may equally carry poison. It seems, then, reasonable to believe that in onchocerciasis we may have a means of determining how drugs act on female filarial worms and of making a comparison of drug with drug, in the hope that the information may have a value outside that particular infection; and since excision of onchocerca nodules about the head is itself a recognised part of treatment, the spacing of two such excisions, with an intermediate drug treatment, seems, in a chronic illness such as this, to be open to no objection, and to be a most promising means of increasing a knowledge of the infection which can hardly but be of value to the many infected with this and kindred parasites.

I am, Sir, yours faithfully,

Castlebar-park, W., March 7th. CLAYTON LANE.

[1] *Trans. R. Soc. trop. Med. Hyg.* 1937, **31**, 61.
[2] *Chin. med. J.* 1936, Suppl. **50**, 402.
[3] *Bull. Soc. Path. exot.* 1923, **16**, 126.

VIKING SURGERY

To the Editor of THE LANCET

SIR,—In connexion with the comment in THE LANCET of Feb. 26th (p. 531) upon Viking surgery and the influence of the Salernitan school, there is a most graphic description of Viking surgery in the Saga of S. Olav (§234) which seems worthy of quotation. At the battle of Stiklestad (July 29th, 1030) Thormod Kolbrúnarskáld, an Icelander and one of King Olav's men, was wounded in the left side by an arrow. He broke off the shaft and made his way to a large barn which had been converted into a dressing station. It was full of wounded men, some discussing the battle and others groaning and crying out with pain. After sitting there for a little while he moved off to an outhouse where apparently the more serious cases were collected and where a woman-leech was dressing the wounds. Seeing his pallor she made him sit down and remove his clothes. She then carefully examined the wound in his side and noticed that in it could be seen a piece of iron, but she could not be certain of the track of the wound, which she had washed with warm water. In a stone kettle stood a concoction of leeks and other herbs

boiled up together "which she gave to the wounded men to take and so tried to find out if they had deep wounds for she could notice the smell of the leek coming out of a deep wound"—a truly drastic diagnostic measure for a penetrating wound of the abdomen! Thormod, however, refused it, saying with grim humour, "It isn't porridge-sickness (*grautsótt*) that I've got." She then took a pair of forceps (*spennitong*) but the tissues were swollen and only a small piece of the iron projected from the wound so that she could not get a grip on it to pull it out. Thormod then told her to cut down on the iron and having gripped it to hand the forceps to him. This was done and he wrenched out the arrow head, which seems to have been near the heart, for as it came away it brought on the barbs "pieces of flesh and fat" and he fell back and died at once.

I am, Sir, yours faithfully,

Birmingham, March 5th. G. A. AUDEN.

REST AFTER OPERATIONS

To the Editor of THE LANCET

SIR,—Dr. Douthwaite, in your current issue, is reported to state that a patient after a clean incision in the abdominal wall is mostly quite fit to get up the next day and even to walk about. One would be glad to know if this opinion is shared by physicians, surgeons, psychologists, and last, yet by no means least, by the patients themselves. Surely the trauma both physical and psychological caused by any abdominal operation demands a longer rest to facilitate quick recovery. In these days of rush, anxiety, and uncertainty with nerve exhaustion making itself increasingly evident, such a proceeding as Dr. Douthwaite advocates would, in many cases, do infinitely more harm to a patient's nervous system than the possibility of flatulence which can be either prevented or cured. Granted that in days gone by we kept our patients in bed too long, one ventures to suggest that this is a wiser course than preventing the complete rest both of mind and body after abdominal operations which any reasonable being has a right to expect.—I am, Sir, yours faithfully,

P. SEYMOUR-PRICE.

Sloane-gardens, S.W., March 7th.

CONTRACEPTION AND FERTILITY

To the Editor of THE LANCET

SIR,—My committee ask me to state that they have decided against publishing a detailed reply to Mr. Green-Armytage's statements about contraceptives. His assumptions appear to be too much a matter of opinion to be suitable for discussion in the press. I am asked to remind your readers that our clinics are open to attendance by any medical practitioners, and that many thousands of case records are available for reference.

The National Birth Control Association maintains that the teaching of contraception should be a matter essentially for the medical profession; and whilst not doubting that indifferent and harmful methods are sometimes employed by the public, it contends that our controlled methods in no way injure health or fertility. This conclusion is shared by all members of the association, including Lord Horder (president), Dr. C. P. Blacker, Mr. Aleck Bourne, Dr. Geoffrey Bourne, Prof. F. J. Browne, Mr. Harold Chapple, Mr. C. Lane-Roberts, Sir Walter Langdon-Brown, Mr. A. C. Palmer, and Mr. L. Carnac Rivett.

I am, Sir, yours faithfully,

M. A. PYKE,
Secretary, National Birth Control Association.

69, Eccleston-square, S.W.1, Feb. 28th.

VENOUS THROMBOSIS IN CANCER OF THE STOMACH

To the Editor of THE LANCET

SIR,—In the recent correspondence in your columns on venous thrombosis as a sign of visceral cancer, Dr. Parkes Weber has raised the question of the pathological explanation of the occurrence of the venous thrombosis in such cases. Personally, I do not believe that thrombosis in malignant disease is of one uniform pathological type, but perhaps the following data may throw some light on the subject. In a series of 142 cases of carcinoma of the stomach coming to autopsy at St. Bartholomew's Hospital during the years 1919–36, there was gross venous thrombosis in six cases.

Case 23: Thrombosis of the inferior vena cava. The liver weighed 9¾ lb. and was filled with necrotic growths. In many places these filled hepatic veins.

Case 26: Thrombosis of the splenic vein, and abscess around it. General peritonitis after laparotomy.

Case 37: Liver contained secondaries spreading along the veins.

Case 43: Thrombosis of left femoral, external, internal, and common iliac veins, and vena cava to level of renal veins. The liver was filled with large secondary growths. Œdema of both legs was present.

Case 48: Thrombosis of right common iliac vein. The liver contained many secondary deposits. Œdema of right leg was present.

Case 136: Pulmonary embolus.

Case 26 can be ignored, as the thrombosis of the splenic vein was a post-operative complication, and not of spontaneous occurrence. In Case 23 the thrombotic process had apparently started in the liver where the hepatic veins were filled with growth, and it spread to the inferior vena cava. In Case 37 there was diffuse involvement of the liver by growth spreading along the veins, but no involvement of veins outside the liver. In Case 43 extensive thrombotic changes were present involving the vena cava, left common iliac veins, and the veins of the left lower limb. The liver was filled with large secondary growths, but these were not obviously within veins. The thrombosis extended to the level of the renal veins. Œdema of both limbs was present. In Case 48 there was thrombosis of the right common iliac vein with œdema of the limb. The liver contained many secondary deposits which were not obviously in veins. In Case 136 death was due to a pulmonary embolus, but there was no definite evidence as to its point of origin. There was no evidence of any peripheral œdema.

In two cases of this series, therefore, 23 and 37, there were tumour-thrombi in the veins of the liver, and in Case 23 the thrombotic process had involved the inferior vena cava. Of the two cases, 43 and 48, associated respectively with bilateral and unilateral phlegmasia alba dolens, both showed extensive deposits in the liver, and in Case 43 there was thrombosis of the deep veins of the left lower limb, the left external and common iliac, and the inferior vena cava as far as the level of the renal veins. In Case 136, where death occurred from a pulmonary embolus, there was no œdema of either lower limb.

In the thrombotic manifestations of visceral malignant disease, various factors are involved, such as pressure on veins, venous thrombosis, tumour-thrombus, and perivenous lymphatic obstruction. Certainly some of the cases of venous thrombosis are due more to the associated cachexia than to the

malignant process. Others again, particularly those in which gross œdema of the limb is present, are secondary to perivenous lymphatic obstruction. Clinically, therefore, the process may manifest itself as a phlegmasia alba dolens or as a silent or occult pure venous thrombosis of which the first and final clinical manifestation may be a pulmonary embolus. As a physical sign of visceral malignant disease, these peripheral œdemas must usually be regarded as manifestations of an advanced stage of the malignant process, or as evidence of a profound nutritional disturbance determined by the site of the disease and its interference with function. The relative importance of œdema and swelling of one or both lower limbs as physical signs of malignant disease may be gauged from the fact that they occurred in only 8 out of 506 cases of cancer of the stomach admitted to the wards of St. Bartholomew's Hospital during the years 1921–32.

I am, Sir, yours faithfully,

REGINALD T. PAYNE.

Harley-street, W., March 7th.

OBITUARY

THE LATE PROF. MAX NEISSER

THE death on Feb. 25th of Emeritus Prof. Max Neisser in his sixty-ninth year creates another blank in that distinguished roll of German bacteriologists who have occupied Chairs of Hygiene modelled on the Koch tradition. The name of Neisser bulks largely in bacteriological literature. Albert Neisser of Breslau, the discoverer of the gonococcus, was an uncle of Max, and the veriest tiro in bacteriology is, at a very early stage, introduced to at least one achievement of the latter—the Neisser stain for *C. diphtheriæ*.

Born in 1869 at Liegnitz in Silesia, Max Neisser removed with his parents to Berlin where he received his schooling and his medical training. The work involved in the preparation of his thesis for the doctorate in medicine, which he obtained in 1893, was carried out in Rubner's laboratory. From 1894 to 1899 he was assistant to Prof. Carl Flügge in the Hygienic Institute, Breslau. In 1899 he met Paul Ehrlich—a great event in his life—and in June of that year joined the staff of the Kgl. Institut f. experimentelle Therapie at Steglitz near Berlin, later in the same year transferred to Frankfurt. He was there given charge of the Department of Bacteriology and became a professor in 1901. In 1909 he was appointed director of the new Städtisches Hygienisches Institut, later to be named the Städtisches Hygienisches Universitäts Institut when the University of Frankfurt was founded in 1914. His post then became that of Professor (Ordinarius) of Hygiene and Bacteriology.

During the war Neisser did valuable service, first in a field dressing station and later as a consultant on hygiene. In 1918 he was given the title of Geh. Medizinalrat.

When the war ended, Neisser returned to his professorial duties, resumed his scientific work, and took a prominent part in the organisation of public hygiene in the city of Frankfurt. In April, 1933, he retired, at the age of 63, and has since held the title of Professor Emeritus.

Since he embarked on his research career 45 years ago Neisser has been a most devoted and assiduous student, and his contributions, which cover a surprisingly wide range, embracing bacteriological, immunological, and hygienic studies, have been many. Before me is a list of no less than 156 titles of contributions by him in the period 1893–1935. Here I can do no more than refer briefly to some of the more outstanding achievements to his credit in the field of bacteriology and immunology.

His sojourn at Breslau under Flügge in the closing years of the nineteenth century gave him an opportunity of studying what was then a very acute and pressing problem, the differentiation of diphtheria bacilli from other diphtheroids, and the elaboration of a working technique for use in institutions concerned with the diagnosis of diphtheria.

The well-known Neisser stain for demonstration of the metachromatic bodies in diphtheria bacilli dates from this period. As one of Ehrlich's band of workers in the Frankfurt Institut, Neisser, with his colleague Wechsberg, took a prominent share in those pioneer studies conducted under Ehrlich's guidance on the nature and mode of action of hæmolysins, antitoxins, and bactericidins in immune sera during the early years of the present century. The Neisser-Wechsberg phenomenon (1901), which disclosed the fact that excess of immune body in relation to available complement interfered with bactericidal action, was an important outcome of this period of his activity. Its precise mechanism is perhaps not even now elucidated and may have to await progress in the physico-chemical attack now being made on the nature of antigen-antibody combinations.

Neisser devoted much attention to the elaboration of accurate plating technique for evaluating bactericidal action, and in connexion with the staphylococcus, on which he wrote widely, he explored with Wechsberg the possibility of detecting by aid of methylene-blue the killing power of staphylococcal leucocidin on leucocyte suspensions (so-called bioscopic method).

In 1903 Neisser's demonstration of the fact that influenza bacilli can be grown on ordinary agar in symbiosis with *B. xerosis* is of considerable historical interest in the light of later developments in our knowledge of the essential growth factors of the hæmophilic group of organisms.

In 1906 a most interesting and fruitful field in bacterial variation was opened up by Neisser's observations on an organism (*B. coli mutabile*) which, when grown on lactose agar, was capable of throwing off variants endowed with the power of fermenting lactose. The analysis of this "mutation" phenomenon, pursued by Massini and Reiner Müller and particularly by Penfold in this country, added much to our knowledge of variation phenomena in bacteria, in so far as their fermentative properties are concerned.

During the period of his Directorship of the Hygienic Institute (1909–33) Neisser's activities, so far as one may judge from the titles of his numerous papers, were, for the most part, bound up with problems of public hygiene, over which he freely ranged, the care of the tuberculous, milk provision, bacteriological water analysis, disinfection and water purification being particularly favoured subjects. In the latter years of his directorship he devoted much attention to the possibilities of water purification by employing the bactericidal action of silver ions. To this subject he devoted the last of his three Harben lectures delivered at the Royal Institute of Public Health in 1932.

There can be no doubt that Max Neisser was an unusually gifted and versatile occupant of the first Frankfurt Chair of Hygiene, beloved of his students, and ever ready to spend himself freely in furthering every project likely to raise the standard of public hygiene in the city of his adoption.

He leaves a widow and three children. His wife was the daughter of Charles Hallgarten, one of the greatest Jewish benefactors of his native town of Frankfurt and one of the founders of its university.

(To my colleague, Miss E. Klieneberger, a former pupil of Neisser, I am indebted for certain details of his career.)

J. C. G. L.

THE LATE DR. HUXLEY FISH.—A correspondent draws attention to the fact that in an obituary notice of Dr. Fish (*Lancet*, Feb. 26th, p. 521) his appointment as physician to Harefield Sanatorium last summer was not mentioned. This appointment gave Dr. Fish the opportunity of extending the scope of his work in a direction which had long been of interest to him. Our correspondent adds, "Dr. Huxley Fish was a great man, great in heart, in intellect, in modesty, and in promise of high achievements in his profession."

PANEL AND CONTRACT PRACTICE

An Inexact Lotion

THE five standing subcommittees appointed to deal with different types of case referred to insurance committees—allocation, dispensing hours, joint services, medical service, and pharmaceutical service—are not convened regularly. Some of them may not have met at all in the twenty-five years during which medical benefit has been in operation. Meetings of the joint services subcommittee, for example, are required only when a case concerns a chemist as well as an insurance practitioner. A case recently arose in Scotland and was referred to the joint services subcommittee in which neither practitioner nor chemist was found to be at fault, but the questions which arose during the investigation showed the need for a more precise definition of a particular lotion.

The insured person's story was that, having just come out of hospital, he had contracted a "cold in his eye." He consulted his insurance practitioner, who prescribed an eye lotion which was to be diluted with four parts of water. The man carried out this instruction, applying the lotion with cotton wool and then blinking the eye in the lotion. Each application was associated with pain in the eye, but the patient thought this not unnatural and persevered. As the eye seemed to be getting worse he consulted a trained nurse, who said she did not think the lotion was for his eye, and applied other treatment which gave him relief. He then saw his doctor, who told him that the lotion supplied by the chemist was not the "Mackenzie's lotion" which he had ordered. The patient then obtained a bottle of Mackenzie's eye lotion from another chemist and this, he said, was not like the lotion supplied by the first chemist.

Evidence was given on oath (in Scotland evidence in medical and pharmaceutical service cases is so given) by the wife of the insured person and by the nurse. The practitioner, also on oath, stated that the patient had had a nerve section done in the hospital for trigeminal neuralgia. Owing to temporary paralysis of the right eyelid and consequent exposure of the eye to irritation the eye became infected after the patient's return home. The man consulted him, and he prescribed Mackenzie's eye lotion and gave appropriate directions for its use; when, later, the patient told him it hurt his eye he asked to see the lotion and found that it did not answer to the usual description of Mackenzie's eye lotion, as recognised in the district. He referred to the formula in the Pharmaceutical Formulary and said that if the chemist had any doubt as to the strength of the lotion he should have communicated with him. It emerged that the local eye infirmary had in their pharmacopœia a formula for Mackenzie's eye lotion which had been well known in the district for a number of years. The prescription was dispensed by the chemist, however, according to the formula for Mackenzie's eye wash in the Extra Pharmacopœia (Martindale) which was the only formula he knew of for Mackenzie's eye lotion. The subcommittee found no evidence that the lotion was improperly made up according to that formula and held that neither the doctor nor the chemist was in breach of his respective terms of service. They noted also that, while the patient might have suffered some temporary discomfort following the application of the lotion, there was no evidence of injury to his eye. About a fortnight after receiving the prescription for the lotion the patient was declared fit and resumed work.

The subcommittee recommended that no further action be taken in this case, but that the prescription should be referred to the panel committee in order to eliminate any doubts about the dispensing of this lotion in future. The result is satisfactory both to the doctor and to the chemist. It is possible that the patient may not be so well satisfied. Part of his case was that owing to the state of his eye he could not return to work when he expected to after his operation, and that as a result he had lost his situation. Although, as he told the subcommittee, he was employed elsewhere in a temporary capacity, he will probably blame the lotion for his ill-luck.

JOURNÉES MÉDICALES DE BRUXELLES.—This congress will be held in Brussels from April 16th to 20th, and on the last day of the meeting a visit will be paid to Ghent to see the Floralies Gantoises. The scientific programme includes papers by M. Ascoli (Palermo), A. Bessemans (Ghent), P. Bordet (Brussels), A. Castellani (Rome), and W. Falta and S. Jellinek (Vienna). Further information may be had from Dr. René Beckers, 141, rue Belliard, Brussels.

PARLIAMENTARY INTELLIGENCE

MORE BORSTAL

ON March 1st the House of Commons went into Committee of Supply on the Civil Estimates, and Sir S. HOARE, the Home Secretary, explained that extra Borstal accommodation was necessary. There was no reason to suppose that the new generation was going to the dogs. If statistics suggested that the young were becoming more and more criminal, this was capable of a simpler and more accurate explanation. So far as Borstal cases were concerned, the main reasons for the increase were three: first, the passing of the Children Act, which had greatly stimulated public interest in the whole question of the treatment of juveniles; secondly, the fact that only about a year ago the age for boys and girls in Borstal institutions was raised from 21 to 23; and thirdly, the fact that we were now beginning to feel the results of the increase of population in the years immediately after the war. A new Borstal institution for boys was needed at once, both for the extra numbers and to provide better individual treatment. The Home Office proposed to take over what in the past was the London County Council centre for unemployed at Hollesley Bay, Suffolk, which was particularly suitable for a Borstal institution. They intended to divide the boys into four or five separate communities, run upon what in schools was called the "house" system, all of them open to the country and not enclosed by high walls. There would eventually be 300 boys at Hollesley Bay, but they would start on a smaller scale.

On a vote for Approved Schools, Sir S. HOARE said that this vote was in some respects similar to the last one, but it dealt with younger boys and girls. Here also they found that there was an increase in numbers in recent years. One of the most frequent causes of these children being sent to approved schools was the fact that they had a broken home life. There was nothing particularly criminal or malicious about these cases, but the home life of the children made it desirable that they should be placed in respectable homes for a certain period. He had sent out a circular to local authorities emphasising the importance of this matter and was glad to say that they were building remand homes more and more and developing the work in them. He was convinced that by this means the State would be saved money by preventing these children drifting into crime.

NOTES ON CURRENT TOPICS

Rent Restriction

In the House of Commons on March 2nd Sir K. WOOD, the Minister of Health, in moving the second reading of the Increase of Rent and Mortgage Interest (Restrictions) Bill, said there was a marked difference between the housing situation in England and Wales and in Scotland, but the Government believed that in all three countries it was in the national interest that decontrol should be effected as soon as there was an adequate supply of housing accommodation. The Ridley Committee, in their recent report, had pointed out that the supply of houses had much more than kept pace with the growth of population. In England and Wales in 1921 there were 4·67 persons per house, while in September, 1936, there were 3·64. As regards the proposal for the establishment of permanent tenancy courts the Government took the view that there was no necessity for an additional judicial tribunal.—Sir F. FREMANTLE said that in the interests of health and housing and of the tenant he strongly supported the Bill, and it was read a second time.

Stillbirths in Scotland

In the House of Commons on March 2nd Major NEVEN-SPENCE asked leave to introduce a Bill for the registration of stillbirths in Scotland. The Bill, he said, was not intended to deal with miscarriages, whether criminal, legal, or brought about by natural causes. He had a list of 38 principal civilised nations in which stillbirths were registered, but Scotland was not in that list. There was a case for this Bill on purely statistical grounds. In England stillbirths as well as live births were registered and entered into the computation of the maternal mortality-rate. In Scotland only live births were so registered and used, which prevented a true comparison. When this matter was considered from the point of view of maternal mortality the vital fact was not so much that a child had been born alive or dead, but that a child had been born at all. Those in charge of public health administration in Scotland had long favoured the registration of stillbirths, because it might throw some light on the causes of the unduly high infant and maternal mortality and puerperal morbidity. The efforts made in Scotland to deal with this problem had made but little headway. Scotland had an infant mortality-rate of 82 per 1000. In England the rate was 59; in Switzerland 47; in the Netherlands 39; and in New Zealand 31 per 1000. The same criticism could be levelled at the maternal mortality-rate in Scotland which was 6 per 1000, and was not showing any sign of decrease.

On March 7th the Bill was read a second time and committed to a standing committee.

On March 7th the Street Playgrounds Bill was read the third time.

On March 8th, in the House of Lords, the Blind Persons Bill and the Population (Statistics) Bill passed through Committee and the National Health Insurance (Amendment) Bill was read a second time.

QUESTION TIME

WEDNESDAY, MARCH 2ND

Mortality-rate of Nyasaland Native Miners

Mr. CREECH JONES asked the Secretary of State for the Colonies whether, in view of the report of the senior provincial commissioner of Nyasaland on Nyasaland natives working in the Union of South Africa and in Southern Rhodesia, which stated that the annual death-rate of Nyasaland workers on the South African mines was 20·28 per thousand, as against a general death-rate on the mines, for all natives, of 6·66 per thousand, he would give instructions that no further recruitment for such work should take place in Nyasaland.—Mr. ORMSBY-GORE replied: The question of the recruitment of native labour for work on the mines in the Union of South Africa was recently discussed by the governors of Southern and Northern Rhodesia and Nyasaland with a representative of the Transvaal Chamber of Mines. The mortality statistics quoted by the hon. Member, together with their explanation in paragraphs 21 and 22 of Mr. Abraham's report, were taken into consideration, and in the light of this and other factors it was decided that the recruitment of Nyasaland and Northern Rhodesia natives on a limited scale must still be regarded as experimental for a further period of one year. I am awaiting a full report from the governors concerned, but until the result of the extended experiment can be measured I am not prepared to issue instructions in the sense proposed in the question. The hon. Member is no doubt aware that the numbers recruited under the experimental arrangement are only a small proportion of those who actually find their way to work in the mines.

Penalising the Seller of Unsound Food

Mr. SORENSEN asked the Minister of Health whether in view of the undesirability of penalties being inflicted by magistrates that involved the public notification of an offence being affixed to the premises of the offender, he would take steps to end this practice.—Mr. BERNAYS, Parliamentary Secretary to the Ministry of Health, replied: I understand that the hon. Member refers to a

recent case in which a court ordered the affixing of a notice to premises under powers contained in Section 180 (4) of the Public Health (London) Act, 1936. I would point out that the repeal of this subsection without re-enactment is proposed in the draft Food and Drugs Bill recently issued with the third interim report of the Local Government and Public Health Consolidation Committee.

THURSDAY, MARCH 3RD

Education Authorities and Physical Training

Mr. EDE asked the Parliamentary Secretary to the Board of Education what indication there was that local education authorities were extending their activities under Section 86 of the Education Act, 1921, as a result of the amendment of that section by Section 6 of the Physical Training and Recreation Act, 1937.—Mr. KENNETH LINDSAY replied: Although the amendment to Section 86 of the Education Act, 1921, has only been in operation for a comparatively short period, there is already ample evidence that local education authorities are making use of their extended powers. In the seven months since August 1st, 1937, forty-three proposals for the benefit of young persons and adults have been approved or are under consideration as compared with eighteen similar proposals in the seven months immediately prior to that date.

Occupational Birth-rates

Sir JOHN BIRCHALL asked the Minister of Health the latest figures of the birth-rate in the following cases: schoolmasters, clergymen, professional men, and skilled and unskilled wage-earners.—Sir KINGSLEY WOOD replied: The Registrar-General's report upon occupational birth-rates in 1931 is not yet complete; and certain advance figures only can be given. The following statement concerning occupational birth-rates in England and Wales in 1931 gives such information as is available:—

	Crude live birth-rate per 1000 married males under 55 years of age.
All married males (including unoccupied) under 55 years of age..	95·9
Clergymen (Anglican Church)	70·5
Teachers (not music teachers)	59·9
Professional occupations (excluding clerical staff)	73·5
Social class III, skilled workers	95·3
Social class V, unskilled workers.. ..	122·2

Accredited and Tuberculin-tested Milks

Mr. PEARSON asked the Minister of Agriculture the total amount of quality bonuses paid for accredited and tuberculin-tested milks and the estimated gallonage on which quality bonuses were paid in Glamorganshire for the years 1936 and 1937.—Mr. MORRISON replied: I regret that the information desired is not readily available, as the records of the Milk Marketing Board relating to sales of milk and payments to producers are not kept by counties, but on a regional basis. In 1936 the amount of accredited milk sold through the Board in the South Wales region, which includes Glamorgan, was 6,164,000 gallons, and the quality bonuses paid from pool funds totalled approximately £25,000. In 1937 the amount was 8,622,000 gallons and the total quality bonus paid was approximately £36,000. The quality bonus on tuberculin-tested milk was not paid prior to Oct. 1st, 1937, when sales of this milk were first brought within the Milk Marketing Scheme. In the last three months of 1937, 508,000 gallons of tuberculin-tested milk were sold through the Board in the South Wales region, the total quality bonus paid amounting to some £4000.

Vaccination Deaths

Mr. GROVES asked the Minister of Health how many death certificates were received during the year 1937 on which death was attributed entirely, or in part, to vaccination, post-vaccinal encephalitis, or vaccinia; what were the ages of the persons to whom the certificates related; and how many of them, and which, would be classified by the Registrar-General as deaths to be included in the vaccinia class.—Sir KINGSLEY WOOD replied: The answer to the first part of the question is nine. The ages of the persons concerned were respectively, 3 months, 4 months (4 cases), 5 months, 7 months, 14 years, and 24 years. As regards the last part of the question all the deaths except that of one child of 4 months have been assigned to the vaccinia class.

MONDAY, MARCH 7TH

B.M.A. and Milk Policy

Mr. GARRO-JONES asked the Minister of Agriculture whether he was aware that the expenditure of the Milk Marketing Board upon advertising the merits of milk was being largely countered by an advertising campaign sponsored by the British Medical Association, in which all milk which had not been treated by certain methods was stigmatised as dangerous to health; whether he was aware that statements in these advertisements were damaging the interests of farmers producing and selling milk which, though not treated by the methods favoured by the association, was accepted by the Ministry as of satisfactory quality; and whether he would recommend to the Milk Marketing Board an advertising policy which would neutralise the damage done to the industry by unsubstantiated statements sponsored by private interests.—Mr. MORRISON replied: I have no information as to whether the advertisements referred to have had the effect ascribed to them and I do not think that any useful purpose would be served by suggesting to the Milk Marketing Board that they should change their present advertising policy, which is designed to encourage the consumption of milk generally.

Mr. GARRO-JONES said that as the Minister did not appear to appreciate all the repercussions of this advertising campaign, he would raise the matter on the motion for the adjournment of the House at the earliest opportunity.*

Government's Milk Policy

Mr. SANDYS asked the Minister of Agriculture when he proposed to introduce a Bill to give effect to the proposals for the development of the Government's milk policy, as announced in Command Paper 5533 issued in July, 1937.—Mr. MORRISON replied: Legislation to give effect to the proposals contained in the Government's white paper on milk policy will, I hope, be introduced shortly after the Easter recess.

Admission of Foreign Professional Men

Mr. ROSTRON DUCKWORTH asked the Home Secretary how many foreign professional men had been allowed in the last two years to settle and practise in this country; and whether he could give the numbers in each profession.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: Foreigners who are admitted to this country are usually admitted for the purpose of visits of varying duration. These periods may be extended on due cause being shown, but the granting of such extensions does not necessarily mean that the foreigner will be allowed to settle down here. For example, a number of foreigners are allowed to remain here for a year or two for business or study, but it is not contemplated that they will settle permanently in the country. All that can be said is that during the year 1937 extensions of stay were granted in

* In the *Times* of March 7th appeared the following letter signed by the chairman, vice-chairman, hon. secretary, and five members of the Non-Party Medical Committee of the House of Commons.

"Sir,—The Conservative Agricultural Committee and the Minister of Agriculture have taken exception to the 'Safe Milk' advertisements issued by the British Medical Association. The Non-Party Medical Committee hold no brief from the B.M.A., but are of opinion that the B.M.A. are bound to defend the rights of the public to know the dangers to which their health is exposed and to know the way to avoid them. Much disease is caused by unsafe milk and would be prevented if the milk were made safe. All liquid milk for human consumption should be adequately pasteurized or boiled.

"The Agricultural Committee cannot dispute 'the facts about unsafe milk' nor the conclusion that 'milk must be made safe.' While they appear to dispute these essential health factors they are stifling their best commercial agents—namely, the medical profession, who are anxious to promote the consumption of more safe milk. Surely the lesson of the Croydon typhoid epidemic applies to milk as to water.

"The sooner the agriculturists can agree with the doctors on a joint policy the better will it be both for health and agriculture."

813 cases of professional men and women who had arrived during the last three or four years. Their occupations can be classified as follows: architects, 19; artists, 25; dentists, 66; doctors, 181; lawyers, 12; writers, 35; others, 475 (including nearly 300 research workers).

TUESDAY, MARCH 8TH

Condemned School Buildings

Mr. WILLIAM JOSEPH STEWART asked the Parliamentary Secretary to the Board of Education the number of elementary schools in England and Wales that were condemned by the Board's survey to be replaced; the number that had been replaced by new buildings; and the number that still remained to be dealt with.—Mr. KENNETH LINDSAY replied: A total of 679 schools were originally placed in Class A of the "Black List," that is, schools reported as unsuitable for continued recognition and incapable of improvement. Of these, 518 have already been dealt with by closure, replacement or reconstruction, and of the 145 still on the list, plans for the replacement or reconstruction of 29 have been approved by the Board. The future of these schools is intimately bound up with reorganisation, which is the main occupation of the Board and the local education authorities at the present time.

MEDICAL NEWS

Society of Apothecaries of London

At recent examinations the following candidates were successful:—

Surgery.—P. H. Beamish, St. George's Hosp.; G. H. L. Bullmore, Univ. Coll. Hosp.; P. C. Conran, Univ. Camb. and Middlesex Hosp.; A. W. Frankland, Univ. Oxf. and St. Mary's Hosp.; and S. J. Nathan and J. R. Rose, Charing Cross Hosp.

Medicine.—F. E. Buckler, London Hosp.; E. E. Bullock, Univ. Leeds; G. G. O. Evans, Charing Cross Hosp.; J. B. Good, Guy's Hosp.; M. W. Hemans, Univ. Oxf. and St. George's Hosp.; I. M. Monare, Royal Colleges, Edin.; B. Oppenheim, Univ. Manch.; E. S. Reed, Univ. Camb. and St. Mary's Hosp.; A. T. Rogers, St. Mary's Hosp.; and G. L. Young, St. Bart.'s Hosp.

Forensic Medicine.—A. Backman, Guy's Hosp.; F. E. Buckler, London Hosp.; E. E. Bullock, Univ. Leeds; J. B. Good, Guy's Hosp.; M. W. Hemans, Univ. Oxf. and St. George's Hosp.; B. Oppenheim, Univ. Manch.; E. S. Reed, Univ. Camb. and St. Mary's Hosp.; A. T. Rogers, St. Mary's Hosp.; and G. L. Young, St. Bart.'s Hosp.

Midwifery.—P. H. Beamish, St. George's Hosp.; G. E. N. Bird, St. Bart.'s Hosp.; F. P. S. Malone-Barrett, Westminster Hosp.; B. Oppenheim, Univ. Manch.; A. Smith, St. Mary's Hosp.; and B. W. S. Spurgin, Univ. Manch.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery: P. H. Beamish, E. E. Bullock, G. G. O. Evans, A. W. Frankland, J. B. Good, S. J. Nathan, E. S. Reed, A. T. Rogers, and G. L. Young.

Leeds University

Dr. W. E. Adams has been appointed lecturer in histology in the University.

British Institute of Philosophy

An address entitled The Philosophy of Mysticism will be given by The Very Rev. W. R. Inge on Monday, March 21st, at 8.15 P.M., at University College, Gower-street, London, W.C. Tickets may be had from the director of studies at University Hall, 14, Gordon-square, London, W.C.1.

Chadwick Lecture

On Thursday, March 24th, at 5.30 P.M., at the London School of Hygiene, Keppel-street, W.C., Mr. W. J. E Binnie will speak on water-supply in relation to public health. Admission to the lecture is free, and further information may be had from the secretary at the offices of the Chadwick Trust, 204, Abbey House, London, S.W.1.

Lectures in Hospital Administration

A three months' course of lectures and demonstrations on clinical practice and hospital administration will be given by Dr. J. V. Armstrong at the Brook Hospital, Shooters Hill, Woolwich, S.E., on Mondays, Wednesdays, and alternate Saturdays, beginning on April 4th. Further particulars may be had from the medical officer of health of the London County Council, Public Health Department (Special Hospitals), County Hall, S.E.1.

Deutsche Gesellschaft für Innere Medizin

This society will meet at Wiesbaden from March 28th to 31st under the presidency of Prof. Assmann (Königsberg). The principal subjects for discussion will be tests of heart function, function and diseases of the adrenals, vitamin B, and acute inflammatory disease of the central nervous system. Further information may be had from the Verkehrsbüro, Wilhelmstr. 24, Wiesbaden.

University of Cape Town

On March 8th Dr. A. W. Falconer, professor of medicine in the university, was installed as principal and vice-chancellor in succession to Sir Carruthers Beattie, who has retired.

American Laryngological, Rhinological and Otological Society

This society will hold its annual meeting in Atlantic City on April 27th, 28th, and 29th under the presidency of Dr. Samuel J. Kopetzky. Mr. V. E. Negus (London) and Prof. Henri Coutard (Paris) will speak at the meeting. Further information may be had from the secretary, Dr. C. Stewart Nash, 708, Medical Arts Building, Rochester, N.Y.

International Medical Post-Graduate Academy in Budapest

At the thirteenth International Medical Congress in Budapest, in 1909, the International Medical Post-graduate Committee was formed, and it held its second session at the International Medical Congress held in London in 1913. At the International Medical Post-graduate Congress held in Berlin last August, at which 44 nations were represented, it was decided that an International Medical Post-Graduate Academy should be established at Budapest, and the Hungarian Medical Post-graduate Committee has been asked to arrange a meeting there on April 24th when a course of lectures on research and post-graduate training will be given. Further information may be had from Prof. Emile de Grósz, Üllői-ut 26, Budapest, VIII.

Society of Public Analysts

Dr. G. Roche Lynch, retiring president, took the chair at the sixty-fourth anniversary dinner of the Society of Public Analysts and other Analytical Chemists, when Mr. Norman Birkett, K.C., proposed the toast of The Society, whose work, he said, was always devoted to the public advantage and the public weal. Dr. Lynch, in reply, asked those present to drink the health of Mr. Bernard Dyer, D.Sc., the only surviving foundation member present. During its long existence, he said, the society had done much to raise the status of public analysts and by its regular meetings and by its organ *The Analyst* had contributed much to an essential branch of chemistry. The association of public analysts with the law was recognised by the presence there of Mr. Justice Singleton, the public prosecutor, and the chief commissioner of police, while the cordial relation between pure and applied chemistry was evident from the presence of the presidents of the Chemical Society, the Institute of Chemistry, and the Institution of Chemical Engineers. In proposing the toast of H.M. Judges, Mr. E. Richards Bolton, a past-president, spoke of the confidence in their consideration and patience felt by any expert witness who was ready to help the court. Mr. Justice Singleton had kind things to say about the conduct of the bar and the efficiency of jurors, but Mr. Birkett was less impressed. Jurors, he said, varied. He complained, too, that the chairman often made the work of defending counsel difficult, for he found blood stains where no other human being or even bloodhound could find them; yet the defence would always rely on his fairness. Mr. A. L. Bacharach toasted The Guests, and Lord Cornwallis, Sir Philip Game, and Sir Robert Pickard replied.

Course on the Bug Nuisance

The Royal Sanitary Institute will hold a further fortnight's course of instruction in disinfestation of houses and furniture from the bed-bug, beginning on Monday, May 16th. Full particulars can be had from the secretary of the institute, 90, Buckingham Palace-road, London, S.W.1.

Prof. Jung's Lectures Postponed

On account of illness Prof. C. G. Jung of Zürich has had to postpone the lectures for medical practitioners which he had arranged to give at the Tavistock Clinic from April 4th to 8th. If his health permits he hopes to give them during the week Oct. 3rd to 7th.

Royal Society of Arts

On Wednesday, March 23rd, Lord Horder will deliver the Trueman Wood memorial lecture to this society at 8.30 P.M. He will speak on Public Health: the Hygiene of a Quiet Mind. The following Wednesday at 8.15 P.M., Sir Aldo Castellani will read a paper on the hygienic measures and hospital organisation of the Italian Expeditionary Forces during the Ethiopian war, 1935–36. Both lectures will be given at the house of the society, John-street, Adelphi, London, W.C.

British Postgraduate Medical School

On April 6th, 13th, 20th, and 27th, at 4.30 P.M., Dr. C. H. Andrewes will lecture on recent work on viruses in the department of pathology of the school. In the department of medicine Sir Edmund Spriggs will give six lectures, beginning on Monday, March 28th, at 2.30 P.M. He will speak on diseases of small and large intestine. A limited number of tickets are available and may be had on application to the dean of the school, Ducane-road, London, W.12.

Incorporated Society of Chiropodists

The annual convention of this society, which is this year celebrating its silver jubilee, will be held in London on March 18th and 19th. Prof. J. H. Burn will deliver a lecture on the disinfection of the skin and of superficial wounds, and films will be shown by Mr. H. A. T. Fairbank (open operation on congenital dislocation of the hip), Sir Harold Gillies (hinged graft for depressed nasal bridge), Mr. R. Watson Jones (treatment of fractures of both bones of the leg), and Dr. Erwin Straus (electrodiagnostics on the healthy body). The society may be addressed at 21, Cavendish-square, London, W.1.

Premarital Advice in Australia

At a pre-marriage clinic, now open in Sydney, health tests are available for couples about to marry. With a subsidy from the New South Wales government, the Racial Hygiene Association has sponsored the clinic, which arranges an overhaul for a nominal fee, with advice, where required, from twelve specialists. It issues certificates that the two parties are fit to marry and raise a family; or that the marriage should be delayed, or should be permitted without parentage, or should definitely be discouraged. The clinic is already receiving about 100 letters each month from people wanting help on marriage problems.

Francis Amory Septennial Prize

Under the will of the late Francis Amory of Beverly, Massachusetts, the American Academy of Arts and Sciences administer a fund to provide a septennial prize for outstanding contributions to knowledge "through experiment, study or otherwise . . . in the diseases of the human sexual generative organs in general" during the seven years preceding any award. If there is work of a quality to warrant it, the first award will be made in 1940. The total amount of the prize will exceed 10,000 dollars, and it may be given in one or more awards. While there will be no formal nominations, and no formal essays or treatises will be required, the committee invites suggestions, which should be made to the Amory Fund Committee, care of the American Academy of Arts and Sciences, 28, Newbury-street, Boston, Massachusetts, U.S.A.

Medical Diary

March 14th to March 20th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY.

United Services. 4.30 P.M., Group Captain A. F. Rook: Infection of the Urinary Tract in the Male.

TUESDAY.

General Meeting of Fellows. 5.30 P.M.

Pathology. 8.15 for 8.30 P.M., annual general meeting. D. G. H. Edward: Agent Responsible for the Gordon Test in Lymphadenoma. A. Felix: Serum Diagnosis of Chronic Typhoid Carriers. R. Cruickshank: Puerperal and Post-abortal Infections Associated with Anaerobic Bacteria. J. R. Gilmour: Bone and Adrenal Changes in Erythroblastosis Fœtalis.

THURSDAY.

Dermatology. 5 P.M. (Cases at 4 P.M.) Dr. H. MacCormac: (1) Generalised Scleroderma.

Neurology. 8.30 P.M. Dr. S. De Navasquez and Dr. H. Treble: Primary Generalised Amyloid Disease with Involvement of the Nerves.

FRIDAY.

Physical Medicine. 4.30 P.M. Lord Dawson: Physical Education. Prof. B. A. McSwiney and Major W. Campbell will also speak.

Obstetrics and Gynæcology. 8 P.M. Mr. J. Bright Banister and Mr. A. H. McIndoe: Congenital Absence of the Vagina Treated by Means of the Indwelling Skin Graft. Mr. Neon Reynolds: Post-maturity. Mr. R. H. Paramore: Lower Uterine Segment Cæsarean Section. (Film.)

Radiology. 8.30 P.M. Prof. Henry Cohen, Dr. Duncan White, and Dr. M. H. Jupe: Skeletal Changes in Metabolic and Endocrine Disorders.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

THURSDAY.—8.15 P.M., laboratory meeting at the Royal Army Medical College, Grosvenor-road, Millbank, S.W.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY.—8.30 P.M., Dr. Izod Bennett, Mr. A. Dickson Wright, and Dr. W. G. Oakley: Uræmia.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.

FRIDAY.—5 P.M., Dr. Arthur Massey, Dr. James Ferguson: Hospital Policy in Relation to Preventive Medicine. 8.30 P.M. (*Maternity and Child Welfare Group*), Dr. J. E. Wilson: How to Breathe.

CHELSEA CLINICAL SOCIETY.

TUESDAY.—8.30 P.M. (Hotel Rembrandt, Thurloe-place, S.W.), Dr. A. F. H. Coke: Sedimentation Tests in Rheumatism.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY.

THURSDAY.—9.15 P.M. (Royal Northern Hospital, N.), Dr. J. Kerr Russell: Treatment by Hyperpyrexia.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.

THURSDAY.—8.30 P.M., Dr. Van de Maele: The Direct Radiokinematography.

FRIDAY.—11 A.M., visit of medical members to the in-patient department of the Western Hospital for Nervous Disease Gloucester-gate, N.W. 5.30 P.M., case demonstration and discussion.

SOCIETY OF RADIOTHERAPISTS OF GREAT BRITAIN AND IRELAND.

FRIDAY.—5 P.M. (11, Chandos-street, W.), Dr. G. F. Stebbing, Dr. J. R. K. Paterson, Mr. B. W. Windeyer, and Mr. L. H. Clarke: Methods of Measuring and of Recording Dosage.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY and THURSDAY.—5 P.M., Dr. George Riddoch: Pain of Central Origin. (Lumleian lectures.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY.—5 P.M., Dr. L. W. Proger: demonstration of new museum specimens.

FRIDAY.—5 P.M., Dr. A. J. E. Cave: Anatomy of the Skin.

UNIVERSITY OT LONDON.

TUESDAY.—5 P.M. (University College, Gower-street, W.C.), Prof. A. P. H. De Kleijn: Some Remarks on Vestibular Physiology.

UNIVERSITY OF GLASGOW.

TUESDAY.—4.30 P.M. (Tennent Memorial Building, Church-street), Prof. A. J. Ballantyne: Diseases of the Iris, Ciliary Body and Choroid.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland-place, W.

WEDNESDAY.—3.30 P.M., Dr. W. S. C. Copeman: Rheumatism and the National Health.

INSTITUTE OF CHILD PSYCHOLOGY.

MONDAY.—6.15 P.M. (Friends House, Euston-road, N.W.), Dr. Elspeth Macleod: The Satisfactory Adolescent. 8.15 P.M., Dr. Ethel Dukes: Success in Family Life.

ST. GEORGE'S HOSPITAL, S.W.

THURSDAY.—5 P.M., Dr. Antony Feiling: neurological demonstration.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Dr. T. H. Belt: Pulmonary Embolism. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. C. R. Harington, F.R.S.: The Thyroid and its Secretions.

THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Mr. V. B. Green-Armytage: Sterility. 4.30 P.M., Mr. Kenneth Walker: Venereal Diseases.

FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. Geoffrey Keynes: Diseases of the Breast.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY.—2 P.M., Mr. James Crooks: Some Problems of Hearing in Infants and Young Children. 3 P.M., Dr. W. G. Wyllie: Infantile Convulsions.

Out-patient clinics daily at 10 A.M., and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY.—3.30 P.M., Dr. C. P. Symonds: Cerebral Tumours (3).

TUESDAY.—3.30 P.M., Dr. F. M. R. Walshe: Diseases of Extrapyramidal Motor System.

WEDNESDAY.—3.30 P.M., Dr. Walshe: clinical demonstration.

THURSDAY.—3.30 P.M., Dr. Denis Brinton: Vascular Disease of the Nervous System.

FRIDAY.—3.30 P.M., Dr. E. A. Carmichael: Friedreich's Ataxia.

Out-patient clinic daily at 2 P.M.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

MONDAY to SATURDAY.—General practitioners' week.

FRIDAY.—4 P.M., Mr. A. Lowndes Yates: Familial Throat and Nose Affections.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.

WEDNESDAY.—4 P.M., Dr. H. Courtney Gage: Radiology in Obstetrics and Gynæcology.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.

TUESDAY.—5.30 P.M., Dr. John Parkinson: Myocardial Disease.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY to SUNDAY.—ROYAL CHEST HOSPITAL, City-road, E.C., Mon., Wed., and Fri., 8 P.M., course in diseases of the heart and lungs.—ALL SAINTS' HOSPITAL, Austral-street, S.E., Sat. and Sun. course in urology.—F.R.C.S. (PRIMARY) PHYSIOLOGY COURSE, Mon., Wed., and Fri., 5.30 P.M.—BROMPTON HOSPITAL, S.W., twice weekly, 5.15 P.M., M.R.C.P. course in chest diseases.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.

FRIDAY.—4.30 P.M., Mr. A. G. Timbrell Fisher: Physical Medicine and Orthopædic Surgery (2).

MANCHESTER ROYAL INFIRMARY.

FRIDAY.—4.15 P.M., Dr. Norman Kletz: clinical demonstration.

LEEDS GENERAL INFIRMARY.

TUESDAY.—3.30 P.M. (Maternity Hospital), Mr. A. M. Claye: Some Clinical Points in Antenatal Supervision.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY.—4.15 P.M. (Eye Infirmary), Dr. S. Spence Meighan: Injuries of the Eye.

Appointments

ATKINSON, E. C., M.B. Lond., Resident Aural Registrar at the Hospital for Sick Children, Great Ormond-street.

DE, HIREN, M.R.C.S. Eng., Casualty Officer and Fracture House Surgeon at the Chesterfield and North Derbyshire Royal Hospital.

DURAND, R. W., M.R.C.S. Eng., Secretary to the London and Counties Medical Protection Society.

FEGGETER, G. Y., M.S. Durh., F.R.C.S. Eng., Hon. Assistant Surgeon to the Royal Victoria Infirmary, Newcastle-upon-Tyne.

MCCRACKEN, D. A., M.B. Glasg., D.P.H., Assistant Medical Officer of Health and Assistant School Medical Officer for Cannock.

TURNER, A. F., M.B. Belf., D.P.H., Assistant School Medical Officer for Huddersfield.

TWOMEY, T. P., M.B. Liverp., D.M.R.E., D.P.H., Resident Medical Officer at Bradley Wood Sanatorium, Huddersfield.

WATERSON, DOROTHY, M.B. Edin., D.P.H., Female Venereal Diseases Officer at Leicester Royal Infirmary.

WINTELER, J. C., M.D., M.R.C.P. Lond., Assistant Physician to the Belgrave Hospital for Children.

London County Council Hospital Staff.—The following appointments, promotions, and transfers are announced. A.M.O. (I) or (II) = Assistant Medical Officer, Grade I or II:—

VAN LANGENBERG, E. R., M.R.C.P. Lond., A.M.O. (I), St. Nicholas';

GALLEN, BEDELIA, M.B. Glasg., A.M.O. (II), Bethnal Green;

BEADNELL, LOUIE M. M., M.R.C.S. Eng., A.M.O. (II), Bethnal Green;

DAVIDSON, W. G., M.B. St. And., A.M.O. (II), Dulwich;

RODGER, D. E., M.D. McGill, L.M.S. N.Scotia, P.M.Bd., A.M.O. (II), Fulham;

POND, E. D., M.R.C.S. Eng., A.M.O. (II), New End;

ABRAMOVICH, HYMAN, M.B. Sydney, A.M.O. (II), St. Nicholas';

SHAPIRO, ALEXANDER, M.B. Lond., A.M.O. (II), St. Leonard's;

STERN, HEDWIG H., M.D. Berlin, L.R.C.P. Edin., A.M.O. (II), St. Leonard's;

QUIN, B. O., M.B. N.Z., M.R.C.P. Lond., A.M.O. (II), North-Eastern;

TOMBLESON, J. B.L., M.D. Lond., A.M.O. (II), South-Eastern;

FORREST, SCOTT L., M.B. Edin., D.P.H., A.M.O. (II), Western;

BRADY, TERENCE, M.B. N.U.I., House Physician, Downs;

MARTIN, ELIZABETH, M.B. Aberd., House Physician, High Wood;

LAMB, H. D., L.M.S.S.A. Lond., House Physician, Lewisham;

DOEY, W. D., B.A. Camb., M.R.C.S. Eng., House Surgeon, Mile End;

POLLEY, S. F., M.R.C.S. Eng., House Physician, St. Giles';

MARTIN, MARY M., M.B. Aberd., House Physician, St. Luke's, Chelsea;

STRAUSS, J. N., M.B. Manch., M.R.C.P. Lond., D.T.M. & H., Clinical Assistant (part-time), Whitechapel Clinic;

ROBB, T. M., M.R.C.S. Eng., Senior A.M.O. (II), Lambeth;

ARMSTRONG, J. R., M.B. Belf., Senior A.M.O. (II), St. Peter's;

LAIRD, ROBERT, M.B. Glasg., F.R.C.S. Edin., Senior A.M.O. (II), St. Mary Abbots;

LAWSON, R. S., M.S. Melb., A.M.O. (I), St. Alfege's;

BOUCHER, C. A., B.M. Oxon., A.M.O. (I), Paddington;

PALMER, E. A. E., M.B. Camb., D.A., A.M.O. (I), Lewisham;

BIRRELL, N. V., M.B. Glasg., D.P.H., A.M.O. (I), St. Stephen's;

SMELLIE, ELSPETH W., B.M. Oxon., A.M.O. (II), White Oak;

NEVIN, MARY E., M.B. Belf., A.M.O. (II), North-Eastern; and

DROSSO, VICTOR, M.R.C.S. Eng., House Physician, Mile End.

County Council of Middlesex.—The following appointments are announced:—

GRAIG, D. B., F.R.C.S. Edin., D.L.O., Surgeon (Grade I) at the Redhill County Hospital;

STERN, D. M., M.B. Camb., F.R.C.S. Eng., M.C.O.G., Obstetrician (Grade I) at the West Middlesex County Hospital;

SHEPHERD, H. M. D., M.D., M.R.C.P. Edin., Resident Assistant Medical Officer at the Redhill County Hospital;

EVANS, W. E. F., L.R.C.P. Lond., Resident Assistant Medical Officer at the West Middlesex County Hospital;

MORTON, H. J. V., M.B. Camb., D.A., Resident Assistant Medical Officer at the Hillingdon County Hospital; and

DUNCAN, G. W., M.B. Lond., Resident Assistant Medical Officer at the Hillingdon County Hospital.

London Hospital.—The following appointments are announced:

BUCKLEY, P. S., B.M. Oxon., M.R.C.P. Lond., First Assistant to the Neurological Department;

LAW, W. A., M.B. Camb., F.R.C.S. Eng., Surgical First Assistant and Registrar; and

THOMPSON, V. C., M.B. Lond., F.R.C.S. Eng., First Assistant to the Department of Thoracic Surgery.

St. Albans and Mid Herts Hospital.—The following appointments are announced:—

LINNELL, J. W., M.D. Camb., M.R.C.P. Lond., Hon. Consulting Physician;

WILLIAMS, B. W., M.B. Oxon., F.R.C.S. Eng., Hon. Consulting Surgeon;

MEADOWS, S. P., M.D., M.R.C.P. Lond., Hon. Consulting Neurologist; and

BURROWS, H. JACKSON, M.D. Camb., F.R.C.S. Eng., Hon. Consulting Orthopædic Surgeon.

Colonial Service.—The following appointments and promotions are announced:—

GRIFFIN, W. P., M.B. Dubl., Medical Officer, Cyprus;

MCGLADDERY, H. M., M.B. Lond., F.R.C.S. Eng., Medical Officer, Malaya;

CHRISTIANSON, E., M.B. Edin., Medical Officer, Seychelles;

BAXTER, G. R., M.D. Leeds, D.T.M. & H., D.P.H., Medical Officer of Health and Port Health Officer, Fiji;

MORLEY, A. H., M.B. Lond., D.T.M. & H., D.P.H., Medical Officer, Tanganyika;

PASQUAL, J. R. H., M.B. Edin., Senior Medical Officer, Nigeria;

VAUGHAN, G. W., M.B. Glasg., Senior Medical Officer, Nigeria; and

BLOK, E. A., L.M. & S. Ceylon, L.R.C.P. Edin., Senior Medical Officer, Department of Medical and Sanitary Services, Ceylon.

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Hosp. for Sick Children.—Hon. Asst. Physician.

Accrington Borough.—Deputy M.O.H. and School M.O., £500.

Acton Hosp., W.—Cas. O., at rate of £150.

Barbados General Hosp.—Med. Supt., £700.

Bedford County Hosp.—H.S., at rate of £155.

Birmingham Ear and Throat Hosp.—Third H.S., at rate of £150.

Birmingham and Midland Eye Hosp.—H.S., at rate of £130.

Birmingham, St. Chad's Hosp.—H.S., at rate of £150.

Birmingham, Selly Oak Hosp.—Res. Physician, £650.

Blackburn County Borough.—Asst. M.O.H. and Asst. School M.O., £600.

Bolton Royal Infirmary.—Asst. Res. Surg. O., £200.

Bradford, Grassington Sanatorium.—Asst. M.O., £175.

Brighton, Royal Sussex County Hosp.—Cas. H.S., £120.

British Postgraduate Medical School, Ducane-road, W.—First Asst. in Dept. of Surgery, £250–£500.

Burnley, Victoria Hosp.—H.P., at rate of £150.
Burton-on-Trent General Infirmary.—Sen. H.S., £200.
Buxton, Devonshire Royal Hosp.—Res. M.O. and H.P., at rate of £200 and £150 respectively.
Cambridge, Addenbrooke's Hosp.—H.P., H.S. to Spec. Dept., and Res. Anæsthetist and Emergency Officer, each at rate of £130.
Canterbury, Kent and Canterbury Hosp.—H.S., at rate of £125.
Canterbury, Venereal Diseases Clinic.—Part-time M.O., 3 guineas a session.
Cardiff, King Edward VII Welsh National Memorial Association. Asst. Res. M.O., £200.
Central London Throat, Nose, and Ear Hosp., Gray's Inn-road, W.C.—Reg. and Clin. Tutor, £300.
Cheriscy, Surrey, Bolleys Park Colony.—Deputy Med. Supt., £720.
Chester Royal Infirmary.—H.S. to Ear, Nose, and Throat and Gynæcological Depts., at rate of £150.
City of London Maternity Hosp., City-road, E.C.—Asst. Res. M.O., at rate of £100.
Colonial Medical Service.—Asst. Pathologist in Malayan Med. Service, £700.
Doncaster Royal Infirmary.—Fracture H.S., £200.
Dorset County Council.—County Pathologist, £750.
Durham County Council.—Temp. Asst. M.O.H., £600. Also Asst. Welfare M.O., £500.
Ealing Borough.—Asst. M.O., £450.
Essex Administrative County.—Asst. Specialist Ophth. Surgeon, £700.
Essex County Council.—Part-time Ophth. Surgeon, at rate of £200.
Evelina Hosp. for Sick Children, Southwark, S.E.—H.S., at rate of £120.
Forest Gate Hosp., Forest-lane, E.—Asst. Res. M.O., £350.
Gloucestershire County Council.—Two Asst. County M.O.H.'s, each £500.
Gt. Barrow, Barrowmore Tuberculosis Sanatorium and Settlement. H.P., at rate of £150.
Grimsby Corporation Hosp. and Sanatorium.—Res. M.O., £350.
Halifax Royal Infirmary.—Res. Surg. O., £250. Also H.S.'s, at rate of £200, £175, and £150 respectively.
Hampstead General and North-West London Hosp., Haverstock Hill, N.W.—Res. Cas. M.O., at rate of £100.
Harefield, County Sanatorium.—Physician, £1000.
Haywards Heath, Brighton County Borough Mental Hosp.—Third Asst. M.O., £350.
Hertford County Hosp.—H.P., at rate of £150.
Hosp. for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P., at rate of £150 and £100 respectively.
Hosp. for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. and Out-patient Aural Registrar, £200 and £175 respectively. Also two H.P.'s and two H.S.'s, each at rate of £50.
Hosp. of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H. S., at rate of £75. Also Asst. Phys.
Indian Medical Service.—Commissions.
Isleworth, West Middlesex County Hosp.—Anæsthetist and Asst. M.O., each £400.
Leeds Public Dispensary and Hosp.—H.P., at rate of £150.
Leicester City Mental Hosp.—Asst. M.O., £350.
Lincoln City Hosp. and Sanatorium.—Res. M.O., £300.
Lincoln, The Lawn.—Asst. M.O., £300.
Liphook, King George's Sanatorium for Sailors.—Asst. M.O., at rate of £200.
Liverpool, Alder Hey Children's Hosp.—Res. Asst. M.O., at rate of £200.
London County Council.—Radiologists, each £900; Obstetrician and Gynæcologist, £800. Also Anæsthetists, each £125.
London Hosp., E.—Anæsthetist to Dept. of Neurosurgery, £250.
London Jewish Hosp., Stepney Green, E.—Ear and Throat Registrar, 20 guineas.
Manchester Royal Eye Hosp.—H.S., £120.
Manchester, St. Mary's Hosps.—H.S.'s to Spec. Depts., each at rate of £50.
Manchester and Salford Hosp. for Skin Diseases.—H.S., at rate of £150.
Margate, Royal Sea Bathing Hosp.—Asst. Med. Supt., £500.
Medical Research Council, 38, Old Queen-street, S.W.—Kathleen Schlesinger Research Fellowship, £300.
Middlesex County Council.—Sen. Obstet. Surgeon for Redhill County Hosp., £850. Also Obstet. Surgeon for North Middlesex County Hosp., £500.
Mount Vernon Hosp., Northwood.—H.S., £150.
Newcastle-upon-Tyne, King's College.—Asst. Bacteriologist, £350.
Newcastle-upon-Tyne Royal Victoria Infirmary.—Jun. Gynæcologist and Obstet. Registrar, £300.
North Middlesex County Hosp., Edmonton.—Jun. Res. Asst. M.O., at rate of £250.
Norwich City.—Asst. M.O.H. and Asst. School M.O., £600.
Oxford, Wingfield-Morris Orthopædic Hosp., Headington.—H.S., at rate of £100.
Plymouth, Prince of Wales's Hosp., Greenbank-road.—Asst. Pathologist, £500. Also Jun. H.S., at rate of £120.
Preston and County of Lancaster Royal Infirmary.—Two H.S.'s to Spec. Depts., each at rate of £150.
Preston, Sharoe Green Hosp.—Jun. Asst. Res. M.O., at rate of £100.
Princess Louise Kensington Hosp. for Children, St. Quintin-avenue, W.—H.S., at rate of £120.
Queen Charlotte's Maternity Hosp., Marylebone-road, N.W.—Res. Anæsthetist, at rate of £100.
Queen Mary's Hosp. for the East End, E.—Clin. Asst. to Skin Dept.
Queen's Hosp. for Children, Hackney-road, E.—Asst. Physician.
Rotherham Hosp.—H.P., £180.
St. George's Hosp., S.W.—Physician. Also Asst. Physician.
St. John Clinic and Institute of Physical Medicine, Ranelagh-road, S.W.—Hon. Clin. Asst. in Orthopædic Dept.
St. John's Hosp., Lewisham, S.E.—Hon. Physician to Children's Dept.
St. Mary's Hosp., W.—Med. Reg., £200.
Sheffield Children's Hosp.—H.S., at rate of £100.
Southampton, Free Eye Hosp.—H.S., £150.
Southampton, Royal South Hants and Southampton Hosp.—H.S., at rate of £150.
South-Eastern Hosp. for Children, Sydenham, S.E.—Res. M.O., at rate of £100.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Res. Anæsthetist, at rate of £150.
Stoke-on-Trent, Stanfield Sanatorium.—Res. M.O., £350.
Surrey County Council.—Asst. M.O., £600.
Swanley, Kent, Alexandra Hosp. for Children with Hip Disease.—Second Res. M.O., at rate of £250–£300.
Taunton and Somerset Hosp.—H.S., £125.
Tunbridge Wells, Kent and Sussex Hosp.—Res. Surg. O., £250.
Walsall Manor Hosp.—Res. Asst. M.O., £350. Jun. Asst. M.O., £150. Also Con. Obstetrician and Gynæcologist, 3 guineas per session.
West Bromwich, Hallam Hosp.—H.S., at rate of £200.
West Riding of Yorkshire County Council.—Asst. County M.O., £960.
Westminster Hosp., S.W.—Asst. Physician.
Wigan, Royal Albert Edward Infirmary and Dispensary.—H.S., at rate of £150.
Willesden General Hosp., Harlesden-road, N.W.—Res. Officer, at rate of £100.
Woolwich and District War Memorial Hosp., Shooters Hill, S.E. Res. M.O., £150. Also H.S., at rate of £100.
Worcester County and City Mental Hosp.—Asst. M.O., £350.
Worksop, Victoria Hosp.—Jun. Resident, £125.
Wrexham and East Denbighshire War Memorial Hosp.—Two Res. H.S.'s. Also Res. H.S. to Spec. Depts., each at rate of £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Blandford (Dorset) and Lutterworth (Leicester).

Specialist Medical Referee under the Workmen's Compensation Act, 1925, for Ophthalmic cases arising in the Bristol, Bridgwater, Wells, and Weston-super-Mare County Court Districts (Circuit No. 54). Also Medical Referee (Surgeon) for the same circuit. Applications for appointments should be addressed to the Private Secretary, Home Office, Whitehall, London, S.W.1, before March 30th.

Births, Marriages, and Deaths

BIRTHS

BENSON.—On March 2nd, at Southsea, the wife of Surgeon Lieut.-Comdr. (D) J. C. Benson, R.N.—a son.

BOWES.—On Feb. 28th, the wife of Dr. R. W. Wallace Bowes, Diss, Norfolk—a daughter.

EYTON-JONES.—On March 2nd, at Littlehampton, Sussex, the wife of Dr. F. M. M. Eyton-Jones—a son.

GORDON.—On March 7th, at Hanger Hill, Middlesex, the wife of Dr. Douglas Gordon, of Richmond, Surrey—a son.

JOHNSTON.—On Feb. 28th, at Hatch End, Middlesex, the wife of Dr. M. J. Johnston—a daughter.

LIVINGSTON.—On March 7th, at Glasgow, the wife of Dr. Bruce Livingston—a daughter.

O'SULLIVAN.—On March 5th, at Devonshire-place, the wife of Mr. Vincent O'Sullivan, F.R.C.S.—a son.

PROTHEROE SMITH.—On March 6th, at Topsham, Devon, the wife of Dr. E. H. Protheroe Smith—a daughter.

MARRIAGES

CONDON—TINDALL.—On Feb. 19th, at the Church of St. Charles, Ogle-street, W., Captain G. F. Condon, I.M.S., to Phyllis Margaret Tindall.

DEATHS

BILLUPS.—On March 5th, at Woking, Surrey, Christopher Robert Billups, M.R.C.S. Eng., aged 76.

DARBYSHIRE.—On March 3rd, at Highcliffe, Hants, Douglas Edward Darbyshire, M.B. Vict., formerly of Lincoln.

KIDDLE.—On March 4th, at Bow Common-lane, E., H. Harvard Kiddle, M.R.C.S. Eng., late Capt., R.A.M.C. and I.M.S.

NEWCOMBE.—On March 5th, Frank Newcombe, M.R.C.S. Eng., L.S.A., of Martock, Somerset, aged 83.

PRYCE MORRIS.—On March 4th, Thomas Harold Pryce Morris, M.R.C.S. Eng., of East Grinstead, Sussex, late of Eye, Suffolk, in his 69th year.

SHANN.—On March 8th, at Farnham, Knaresborough, Frederick Shann, V.D., M.R.C.S. Eng., J.P. (Surg. Lieut.-Col., Ret.), aged 88.

TEMPLETON.—On March 7th, at Edgbaston, James Templeton, M.R.C.S. Eng., aged 63.

WHITE.—On March 6th, in Cornwall, as the result of a fall of cliff, Percy Walter White, M.R.C.S. Eng., of Clifton, Bristol.

Sir JOHN LYNN THOMAS gratefully acknowledges hundreds of letters of sympathy from friends made at home and abroad during 46 years of travel, at the tragic accident to his wife whilst gathering flowers on Inland Harbour on the Tivy discovered through her help.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

ENCEPHALITIS VIRUSES IN THE U.S.A. AND JAPAN

A FINAL report on neutralisation tests with virus isolated in the St. Louis epidemic of 1933 appears in the *Journal of Clinical Investigation* for January. The authors (R. S. Muckenfuss, J. E. Smadel, and E. Moore) have used four strains of this virus in testing the neutralising power of the serum of 365 persons living in the St. Louis area. Of these, 126 were said to have suffered from encephalitis during the epidemic; 139 were hospital patients who were supposed to have had no contact with the disease; 78 were known to have been in contact with encephalitis patients or with infected material; and 22 were young persons who had suffered from some form of encephalitis or meningo-encephalitis during the ten years preceding the St. Louis outbreak.

In the group of 126 persons who had had encephalitis the sera of 69 per cent. contained positive neutralising bodies, whilst the sera of 22 per cent. did not; in the remaining 9 per cent. the result was doubtful. In the other groups, totalling 239, the positives were not more than about 27 per cent., whilst the negatives were about 58 per cent., leaving 15 per cent. of doubtfuls. The difference in activity between the sera of the 78 known to have been in contact with infection, and the sera of the 139 without known contact, was almost negligible; in each group 55 per cent. were negative. In considering the results obtained from the 126 who were said to have had encephalitis no attempt was made to discard cases that had been diagnosed on what appeared to have been somewhat slender grounds, and the comparatively low percentage of positive results (69) obtained in this group may be partly explicable by the inclusion of doubtful cases. In two sets of experiments previously published the positive results in convalescent sera were 94 per cent. and 82 per cent. (Wooley and Armstrong 1934, Webster, Fite, Clow, and Muench 1935).

There seemed to be a loose correlation between the severity of the meningeal cellular reaction and the finding of protective antibodies in the sera of the patients. Convalescents with positive sera had had an average spinal-fluid cell count significantly higher than that of patients with negative sera.

JAPANESE OBSERVATIONS

Last April we gave a short account of the work done by a committee set up in 1933 to investigate the outbreaks of encephalitis that have been recurring in Japan at intervals since 1873. This disease has features that distinguish it from the epidemic encephalitis of von Economo and of the St. Louis outbreak.

The pathogenic agent is a filter-passing virus, and R. Inada, chairman of the committee, has lately produced a further report on it (*Pr. méd.* 1937, **47**, 1885). He states that the infected brain kept at 0–4° C. in 50 per cent. glycerin remains virulent for 60 or even 100 days, which is a considerable longer time than was found by Webster and Fite for the St. Louis virus. Infection can be transferred to mice by minute quantities of brain emulsion injected intracerebrally; intranasal inoculation requires rather larger amounts, and for intraperitoneal infection relatively massive quantities are needed. Kasahara has infected mice by inoculation of virus emulsion into the sciatic nerve, whilst under identical experimental conditions subcutaneous inoculations proved negative. After cerebral inoculation into mice the virus has been found in the blood within 30 minutes and up to 60 hours afterwards. After intranasal infection, it is found in the olfactory lobe within 24 hours and in the brain itself about 6 hours later, attaining its maximum about the 3rd and 4th days, whilst in the blood and the viscera it is found within 48 hours, reaches its maximum on the 3rd or 4th day, diminishes on the 5th day, and has almost disappeared about the 7th or 8th day. When the inoculation is subcutaneous the results are quite different. The virus is found in the blood within 10 minutes of inoculation; in the viscera it is found after the 1st day and remains until the 5th day, after which it disappears. Thus, in the mouse, intranasal inoculations behave like intracerebral, subcutaneous like intraperitoneal. In the mouse inoculated intraperitoneally the blood plasma is found to contain more virus than the corpuscles. The virus has been noted in the urine of the mouse after intracerebral inoculation, and in the urine and bile as well as in the viscera of the rabbit after testicular inoculation.

In the monkey, as in the mouse, the intranasal route comes next to the intracerebral in giving the highest proportion of infections. Also in the monkey the virus is found in the peripheral nerves in the same amount as in the nerve centres; but is difficult to find in the viscera. In America it proved impossible to infect rabbits, but this has been done successfully in Japan, and Kasahara by intratesticular inoculations has transmitted the virus from rabbit to rabbit through seven passages. The effects in the rabbit differ somewhat from those in the mouse.

Kept at 1 or 2° C. the virus is highly resistant to drying. Blood virus kept in this way always remains infective for mice for 50 days, and brain virus as long as 100 days. At 25° C. drying destroys infectivity in 30 days, at 37° C. in 13 days. The virus is also resistant to cold, and is still active after exposure to minus 78° C. for 6 days, and to minus 172° C. for 3 days. Whilst it has about the same resistance to heat as that of microbes in general (exposure to 60° C. for half an hour destroys all infective power) it is rather more resistant to ordinary antiseptics.

Attempts have been made to reinfect animals that have previously been inoculated with human virus and have survived. So far the results seem to point to a measure of protection from the first attack. Much experimental work has also been done on the neutralising effect of convalescent serum, but the results obtained in Japan by different observers differ so widely that no dogmatic statement can yet be made. It is clear, however, from experiments in America that the serum of the Japanese convalescent has no neutralising effect on the St. Louis virus.

OVERFEEDING AND PROTEIN METABOLISM

Dr. D. P. Cuthbertson and his fellow-workers at the institute of physiology of Glasgow University have continued their study of the effect of overfeeding on the protein metabolism of man. In three papers published in the *Biochemical Journal* last April they showed that on the addition to an adequate basal diet of a litre of raw or boiled milk (or its equivalent in beef, lactose, and butter) body-weight increased and both nitrogen and sulphur were retained. Similar results followed an equivalent addition of soya bean, flour, lactose, and butter. The addition of glucose to the basal diet reduced the daily urinary output of sulphur and nitrogen.

In a fourth paper Cuthbertson, with J. L. McGirr and H. N. Munro, has examined the effect of muscular work at different levels of energy intake, with particular reference to the timing of the work in relation to the taking of food (*Biochem. J.* 1937, **31**, 2293). The two subjects were over 6 ft. and over 5 ft. 4 in. in height and about 13¼ st. and 10 st. in weight, and the basal (meatless) diets differed accordingly, yielding daily respectively 3533 and 2815 calories and containing 16·32 and 12·21 g. of nitrogen. Work was done on the bicycle ergometer of McCall and Smellie for periods of 55 minutes on two successive days in each series of experiments. It is worthy of note that the smaller and younger man did 48,000 kg.m. (=112 calories), while the other only did 43,100 kg.m. (=101 calories). The

heavier work was found too fatiguing to be comfortably done in one spell and was divided over the day in a later series.

A prolonged period of surfeit of carbohydrates lowered the output of both nitrogen and sulphur and extra work done during the period on selected days raised the excretion of these elements to about the basal output when excess carbohydrate was not taken. The rise was much greater when work was done after meals and was of longer duration (maximum on first post-work day) than when the work was done before meals. On a basal diet also, work after meals makes a greater demand on the proteins of the body than work before meals. Extra carbohydrate taken at the next meal after a work period, in amount sufficient to cover the work, prevented a rise in nitrogen and sulphur excretion, but not if taken before. The authors suggest that the time-relationships offer some explanation of the diversity of results of different investigations into the effect of work on protein metabolism. This seems probable, and these experiments certainly seem to confirm the advice to rest after meals.

Carbohydrate ingested in excess of energy requirements is apparently used by the body to fill the glycogen stores in the liver and muscular and other tissues; when these can hold no more it is burnt in preference to fat or protein. Alimentary glycosuria may even develop as a means of getting rid of carbohydrate excess, but a more usual way is probably fat-formation. When an excess of carbohydrate is available the breakdown of proteins becomes less, and consequently the excretion of nitrogen and sulphur is reduced. The reason why food taken after work should effect a saving in nitrogen and sulphur is not clear, although various possibilities are discussed. Since excretion of these elements after work continues for some days it may be that, while the actual work is done at the immediate expense of carbohydrate reserves, the balance has to be made up again by using protein for carrying on normal activities during the reaccumulation period. If extra carbohydrate is taken during this recovery period it is utilised and deamination of protein is lessened.

CYANIDE POISONING

Ingegno and Franco, of the Long Island College Hospital, Brooklyn, N.Y., report two cases of cyanide poisoning successfully treated with intravenous sodium nitrite and sodium thiosulphate (*Industr. Med.* 1937, **6**, 573).

The first patient was a man of 20 who was removing some cotton from a fumigating tank which had recently been filled with HCN gas. At 10.15 A.M. his fellow workers found him unconscious and not breathing, and he was given artificial respiration. At 10.45, when the ambulance surgeon arrived, he was still unconscious, and was flaccid and cyanotic, with contracted pupils and a rapid weak pulse. Adrenaline and carbogen (carbon dioxide and oxygen) were administered and by 12.15 P.M. he was breathing spontaneously and had a pink colour. At 12.30 he became very violent and his colour was slaty. He was given inhalations of amyl nitrite and 300 mg. of sodium nitrite in 10 c.cm. of water intravenously, followed by 25 g. of sodium thiosulphate in 50 c.cm. of water through the same needle, and later by Coramine and caffeine sodium benzoate. At 1.30 P.M. he vomited and his cyanosis was less, his pulse-rate then being 116 per minute and blood pressure 110/74 mm. At 2.15 the nitrite and thiosulphate were repeated in half the original doses and by 4 o'clock his colour was pink again and pulse-rate 100. At 6 P.M. he was fully conscious and able to speak, and he thereafter made an uneventful recovery. Electrocardiograms taken before, during, and after the second injection showed slight changes. Slurring developed in Q R S of L.2 and L.3 and the T waves increased in voltage from 1½ to 2½ mm. and T_3 became diphasic. A very small Q_1 disappeared and a definite Q_3 of 20 per cent. developed. These changes had gone 20 minutes after the injection. Spectroscopic examination of the blood 1½ hours after the first injection showed no abnormal blood pigments, but 1½ hours after the second injection there was 20 per cent. methæmoglobin and 80 per cent. oxyhæmoglobin.

The second man, aged 25, was admitted to hospital at 10 A.M. An hour before he had "taken one swallow" of a photographic solution containing 2 oz. of KCN and 1 drachm of iodine to the pint. He had promptly felt very sick, vomited, had difficulty in breathing and had lost consciousness. At the hospital he was unconscious and of a dusky hue; his respirations were laboured and he was foaming at the mouth. He was given inhalations of ammonia and caffeine subcutaneously, and his stomach was washed out with hydrogen peroxide. By 11 A.M. he was partially conscious, but his colour was still slaty and he had a rapid pulse and some tremors At 11.20 A.M. he was given inhalations of amyl nitrite and intravenous injections of 300 mg. of sodium nitrite in 10 c.cm. of water and 12·5 g. of sodium thiosulphate in 25 c.cm. of water. At 11.30 A.M. he was put into an oxygen tent. He then improved rapidly and before noon was wanting a cigarette. At 1.20 the nitrite and thiosulphate were repeated in the same doses as before. His cyanosis had by then much improved and he was discharged well three days later.

These cases were probably instances of severe cyanide poisoning, and Ingegno and Franco say of them, "although there was some restoration as a result of immediate non-specific measures, the therapeutic efficacy of nitrite and thiosulphate in bringing about rapid and complete recovery cannot reasonably be denied." The results are, however, obscured by the multiplicity of the antidotes used, and it is perhaps unfortunate that no chemical tests were made of the blood of either patient. Certain effects were undoubtedly due to the specific treatment. Thus, the second man had nausea and palpitations after each injection, and the first developed methæmoglobinæmia and some transient but definite electrocardiographic changes after his second injection. Chen, Rose, and Clowes in 1934 showed experimentally that the combination of sodium nitrite and sodium thiosulphate intravenously protects dogs against 20 M.L.D. of 4–10 per cent. sodium cyanide injected subcutaneously, the action of the nitrite being prompt and of the thiosulphate comparatively slow. They suggested that nitrites first form methæmoglobin from hæmoglobin and that the cyanide then combines with the iron of the methæmoglobin to produce the less toxic compound cyanmethæmoglobin. In the same way sodium thiosulphate forms a less toxic compound, sodium sulphocyanate, by combining with cyanide and oxygen.

INCIDENCE OF TULARÆMIA

THE *Bulletin de l'Office international d'Hygiène publique* for December last contains further reports made to the Office in October on the prevalence of tularæmia. In Germany, Prof. Reiter said, special attention has been paid since the winter of 1930–31 to the incidence of this disease because of its prevalence in the neighbouring countries of Norway and Russia. At the time of the report 2 cases had occurred in the Reich, one in 1931 and the other in 1936, both being due to direct contact with infected animals. In order to prevent the introduction of the disease into Germany the transport of hares and rabbits, living or dead, had been prohibited from the following countries where tularæmia was prevalent—viz., Czechoslovakia, Austria, Hungary, Jugoslavia, Rumania, Bulgaria, Albania, Greece, and Turkey. Surgeon-General H. S. Cumming, delegate of the United States, stated that Vermont and Connecticut were the only States in which tularæmia had not yet been described. The mortality among 7077 cases reported from before 1924 to 1936 was 4·8 per cent. (345 deaths). Dr. Kling, the Swedish delegate, said that 30 cases had been notified in Sweden in 1931 and 51 in 1934, but after this no cases were reported until the end of July, 1937, when three persons in Central Sweden contracted the disease after contact with a hare. In the course of the next two months

93 cases in which the diagnosis was confirmed serologically were reported in the same area. The present epidemic focus was in the immediate neighbourhood of the region in which the disease had been observed in 1934. Dr. L. Prochaska, of Czechoslovakia, reported that 418 cases had been notified in his country, of which 190 were in Moravo-Silesia, 121 in Slovakia, and 7 in Bohemia, of which 1 was an example of laboratory infection. The last human cases had been notified in April, 1937, but infected hares had been found in two districts in Slovakia last September and October.

EXPERIMENTS IN LIVING

Dr. Alexander Barton was born at Dover in 1861 and educated at Harrow, Caius College, and St. George's Hospital. Whilst in practice at Beckenham he became interested in aeronautics and built an airship which made a short flight before sharing the fate common to many of its kind. Undaunted by this disaster, he began to experiment with man-lifting kites and built the first hydroplane. Caloriculture and the making of non-alcoholic wines provided further outlets for his inventive impulses until he joined Rawson's staff as a consulting aeronautical engineer. The war called him back to medicine but the strain of running a large practice undermined his health which, however, was speedily restored at the King Edward VII Sanatorium at Midhurst. He subsequently became D.C.M.S., Ministry of Pensions, for Berkshire and Cambridge before retiring to Alassio where, under local anæsthesia, he was operated on for duodenal ulcer so successfully that he was up and about on the sixth day. Such is a bare outline of the contents of a book [1] which, as Dr. Barton explains in a foreword, he was urged by friends to write. His friends were wrong; not because he has not had an interesting life but because, as he himself admits, he has no literary gift. It is to be regretted that the material was not put into the hands of a practised writer, for the exploits of anyone so vigorous and versatile are undoubtedly worth recording in a style which presents them in graphic form.

FLOODS IN PARIS

Dr. Robert Richard gives an interesting account of Paris floods from the Middle Ages to the present day (*Thèse de Paris*, 1937, No. 790). Although inundations were reported as early as the sixth century of our era, it was not until 1125 that the first detailed description was given. In that year the flood was followed by famine and epidemics, and this happened again and again. It was not indeed until the middle of the nineteenth century that the immediate loss of life and material was not aggravated by starvation and outbreaks of infectious disease. The last great flood in Paris took place in 1910, when, despite considerable inconvenience and danger, the loss of life was fortunately very low, and thanks to the energetic action of the health authorities no epidemic followed. Similar precautions—disinfection, pasteurisation, desiccation of the inundated houses, and a campaign against mosquitoes and rats—proved successful during a flood in the Paris suburbs in 1930.

KERR ON ANGINA PECTORIS

THE career of William Watt Kerr is the subject of a sketch by H. C. Moffitt in the January issue of *California and Western Medicine*. Born in Edinburgh in 1857, the son of an architect, Kerr graduated there in 1881, in the same year as Conan Doyle. Influenced by two uncles and a brother who had been in California for several years in the mining industry, he left his native country to take up practice in San Francisco. As a student, obstetrics had been his favourite study, and with the triumphs of Listerism fresh in his mind he at first devoted himself to that specialty and to surgery. From 1887 to 1889 he was professor of therapeutics in the University of California and from 1889 until his death in 1917 professor of clinical medicine. In the horse-and-buggy days of medicine his consulting and private practice was extensive and onerous, for his genial, honest, and gentle personality radiated confidence, and he was an excellent diagnostician. Later, like many another doctor, he suffered from effort angina, and with curious intentness he studied the various manifestations of the advancing vascular changes. A remarkable account of experiments on himself appeared in a paper on the danger of hot baths in patients suffering from arteriosclerosis (1916). In March, 1917, he delivered his last clinical lecture—on angina—and referred to its graver sensations that cannot well be put in words. "There comes a moment," he said, "when the heart seems all too small to overcome the great pressure gathering in the chest. A massive column of blood seems surging upward and to the left and can find no outlet in passages that feel too rigid. And, rising from the chest, a constricting force grasps the throat and squeezes upward to the angles of the jaw." A month later he was dead.

A LAYMAN'S GUIDE TO ILLNESS

ONE of the drawbacks to books on symptomatology is that, although written with no such intention, they can hardly fail to alarm. The significance of many symptoms may be trivial or grave and the conscientious writer can say no more about them than that, except to refer the patient to his doctor, whither, no doubt, he would have gone in any case. Dr. Belfrage [1] is an apostle of what might be called the Periodic Overhaul School. Thus he would have the blood pressure of all middle-aged and elderly persons taken at regular intervals. Even the doctor, no less than the intelligent layman, may wonder how excessive smoking can be a cause of both hyper- and hypotension. There is the usual diatribe against constipation. Some of the notes on symptoms are curiously incomplete—for example, that on itching, in which no mention is made either of diabetes mellitus or jaundice as a possible cause; but whether or not such omissions are deplorable depends on whether a good theoretical knowledge of what symptoms may mean is more likely to enhance or to allay anxiety.

A REQUEST FROM SPAIN

The organising secretary of the Spanish Medical Aid Committee writes: "I have received a request from Spain for the *Annals of Surgery* for 1937 (Cassell and Co.) and *Surgery, Gynecology and Obstetrics* for 1937 (Baillière, Tindall and Cox). We are anxious to send these out to the surgeons who require them but are equally anxious not to draw on our funds for this purpose if it can possibly be avoided, and we wonder, therefore, whether any of your readers would be prepared to send us these for use in Spain." The committee may be addressed at 24, New Oxford-street, London, W.C.1.

FILM CAPTIONS FOR THE DEAF.—A correspondent suggests that captions such as are used for foreign talking films shown in this country should be shown on all films so that deaf people shall be able to follow the story. The coming of talkies has been a serious blow to the deaf, many of whom have lost all pleasure in this form of entertainment or instruction. Even the aids provided at some cinemas are acceptable only to a minority. Written captions would be welcomed by foreigners among the audience, as well as by the deaf, and our correspondent thinks that the rest of us would readily tolerate and learn to ignore them.

[1] Jack of All Trades. By F. Alexander Barton, B.A. Cantab., M.R.C.S., A.F.R.Ae.S., late D.C.M.S., Ministry of Pensions. London: John Bale, Sons and Curnow. 1938. Pp. 225. 5s.

[1] Illness, Its Story and Common Symptoms. A Guide for the Layman. By S. Henning Belfrage, M.D. Lond. London: Humphrey Milford, Oxford University Press. 1938. Pp. 174. 3s. 6d.